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**Interplay between Patents and Standards in the Information and Communication  
Technology (ICT) Sector and its Relevance to the Implementation of the WTO  
Agreements**

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Intellectual Property, Government Procurement and Competition Division

WTO

*Manuscript date: 3 April 2017*

**Disclaimer:** This is a working paper, and hence it represents research in progress. This paper represents the opinions of the author, and is the product of professional research. It is not meant to represent the positions or opinions of the WTO or its Members, nor the official positions of any staff members. Any errors are attributable to the author. Copies of working papers can be requested from the divisional secretariat by writing to: Economic Research and Statistics Division, World Trade Organization, Rue de Lausanne 154, CH-1211 Geneva 21, Switzerland

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# **Interplay between Patents and Standards in the Information and Communication Technology Sector and its Relevance to the Implementation of the WTO Agreements**

Xiaoping Wu<sup>1</sup>

## Abstract

The interplay between patents and standards in the information and communication technology (ICT) sector has been intensively debated at international, regional and national levels over the past decades. In essence, the debate is firstly about the extent and impact of patent holdup and holdout in the ICT sector, and then about how to eliminate or reduce these practices. While standard setting organizations (SSOs), industry bodies, as well as judicial and administrative authorities have made great efforts to solve the issue of patent holdup and holdout, there is still an ongoing struggle among divergent stakeholders. Patent holdup and holdout directly impacts the innovation and dissemination of patented technology, the harmonization and implementation of standards, and international trade, which are promoted by the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) and the Agreement on Technical Barriers to Trade (TBT Agreement). This working paper provides an overview of the current debate on patent holdup and holdout in the ICT sector, analyses existing policy measures and their limitations, and then highlights the relevance of the WTO to this debate.

**Keywords:** patent, patent holdup, patent holdout, standards, standard setting organizations, FRAND, competition, injunctions, royalties, WTO TRIPS, WTO TBT

**JFL classifications:** K11, K13, K15, K30, O34

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## 1 INTRODUCTION

The interplay between patents and standards in the information and communication technology (ICT) sector has been intensively debated at international, regional and national levels over the past decades.<sup>2</sup> In essence, the focus of the debate is firstly about the extent and impact of patent holdup and holdout in the ICT sector, and then on how to eliminate or reduce these practices. This reflects the tension between patents and standards, arising when a standard incorporates an "essential" patent, and the patent holder and the prospective implementer of the standard are unable to reach an agreement on the terms and conditions of the use of the patent. The reason for the failure to reach agreement can be either that the patent holder wishes to charge the implementer excessive royalties for the use, which leads to the issue of patent holdup; or that the implementer wants to pay the patent holder insufficient royalties, which causes the issue of patent holdout.

Patent holdup and holdout is not a new issue, but it is aggravated in the ICT sector, because of two main features of that sector - interoperability and globalization. The aggravated tension is evidenced by the proliferation of investigations and litigation in North America, Europe and Asia.

The aggravated tension between patents and standards has provoked heated debate in standard setting organizations and industry bodies, as well as administrative and judicial authorities. A series of policy measures has been undertaken to ease this tension, including the requirements of disclosure of patent information and FRAND commitments, ex-ante disclosure of licensing terms and conditions, open standards, patent pool, competition policy, and compulsory licences. These policy measures help to deter patent holdup and holdout to a certain extent, but each of them has its own limitations. As a result, the issue of patent holdup and holdout continues to be at the centre of the debate between stakeholders with divergent interests in the ICT sector.

Patent holdup and holdout has an adverse impact on the innovation and dissemination of patented technology, the harmonization of international standards, and the fair and free flow of international trade, which are promoted by the World Trade Organization (WTO), especially the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) and the WTO Agreement on Technical Barriers to Trade (TBT Agreement). Not surprisingly, the issue of the relationship between standards and IPRs was deliberated in the WTO in 2005 (see section 4.3.1).

This paper provides an overview of the current debate on patent holdup and holdout in the ICT sector, analyses existing policy measures and their limitations, and then highlights the relevance of the WTO TRIPS Agreement and the TBT Agreement to this debate.

## 2 INTERPLAY BETWEEN PATENTS AND STANDARDS

There is no universal definition of standards. In general, a standard is a published document which sets out technical specifications, guidelines or rules for common and repeated use in order to ensure quality, safety and interoperability of products.<sup>3</sup> Standard compliance and harmonization can reduce the costs of product adaption and conformity assessment so as to facilitate companies' access to foreign markets and promote international trade.<sup>4</sup> It can also assure consumers of the quality, safety and interoperability of their purchases.<sup>5</sup> Furthermore, given that standards usually

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<sup>2</sup> For the purpose of this paper, 'ICT sector' is referred to OECD definition, namely 'a combination of manufacturing and services industries that are primarily intended to fulfil or enable the function of information processing and communication by electronic means, including transmission and display.' OECD, *Guide on Measuring the Information Society 2011* (2011) ch 4. This definition was adopted by the Partnership on Measuring ICT for Development, and also used by UNCTAD to publish ICT goods trade data in UNCTADStat. See UNCTAD, 'Trade in ICT Goods and the 2015 Expansion of the WTO Information Technology Agreement: UNCTAD Technical Notes on ICT for Development N.5' (December 2015) TN/UNCTAD/ICT4D/05.

<sup>3</sup> ISO/IEC Guide 2:2004 - Standardization and Related activities — General Vocabulary; WTO Agreement on Technical Barriers to Trade (TBT Agreement), Annex 1 Terms and Their Definitions for the Purpose of This Agreement, para 2; WIPO, 'Standards and Patents' (18 February 2009) SCP/13/2, paras 26-28.

<sup>4</sup> ITU, *Understanding Patents, Competition and Standardization in an Interconnected World* (ITU 2014) 25-29; ISO 'Benefits of International Standards', available at: <http://www.iso.org/iso/home/standards/benefitsofstandards.htm>; WTO, *World Trade Report 2005 - Exploring the Links between Trade, Standards and the WTO* (WTO 2005) 35-51.

<sup>5</sup> WTO, *World Trade Report 2005* (n 4) 35-51.

contain considerable technological information, the use of standards can also promote the dissemination of technology.<sup>6</sup>

There are two basic types of standards: *de facto* and *de jure*. *De facto* standards are created by the adoption of a standard by the market: for example, the adoption by the market of Microsoft Windows as a standard operating system. *De jure* standards are established by international, regional or national standard setting organizations, such as the International Organization for Standardization (ISO), the European Telecommunications Standards Institute (ETSI), and the Institute of Electrical and Electronics Engineers (IEEE). Standards can also be categorized as voluntary or mandatory, although this is not a watertight distinction.

Patents are exclusive rights granted to a patent holder to exploit his patented invention for a limited period of time. The rights include the rights of making, using, offering for sale, selling or importing the patented invention. In general, the patent holder can prohibit others from exploiting his patented invention without his permission.

Conceptually, some argue that patent protection and standardization share certain common objectives, such as they both promote innovation and dissemination of technology.<sup>7</sup> Nevertheless, others argue that patent protection and standardization have two opposing policy goals. It is contended that the value of standardization exists in and is enhanced by the wide and unrestricted use of standards, while patent protection is designed to confer on patent holders the right to prevent the use of patented inventions.<sup>8</sup>

In practice, the tension between patents and standards arises when a standard incorporates a patented technology that is "essential" for the implementation of the standard, in which case the relevant patent is termed a standard essential patent (SEP); and the patent holder and the prospective implementer of the standard are unable to reach an agreement on the terms and conditions of use of the patent either because the patent holder wishes to charge the implementer excessive royalties for the use (patent holdup); or because the implementer wants to pay the patent holder insufficient royalties (patent holdout). It should be noted that while current debates pay more attention to the issue of patent holdup, patent holdout and holdup are two sides of one story and both are likely and condemnable in the ICT sector.<sup>9</sup>

Patent holdup is not a new issue, but it has been aggravated in the ICT sector for two main reasons: the fundamental importance of standards and patent thickets.

First, the fundamental importance of standards for the development of the ICT sector can hardly be overstated. The nature of the ICT sector – its reliance on interoperability – makes standards indispensable for its rapid growth.<sup>10</sup> Standard compliance is an essential precondition for companies' entering and surviving in the extremely competitive ICT markets.<sup>11</sup> In order to obtain

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<sup>6</sup> *ibid* 41.

<sup>7</sup> WIPO SCP/13/2 (n 3) paras 51-53.

<sup>8</sup> WIPO SCP/13/2 (n 3) paras 54-56.

<sup>9</sup> Mark A Lemley and Carl Shapiro, 'Patent Holdup and Royalty Stacking' (2007) vol 85 Texas Law Review 1992; J. Gregory Sidak, 'Holdup, Royalty Stacking, and the Presumption of Injunctive Relief for Patent Infringement: A Reply to Lemley and Shapiro' (2008) vol 92 Minnesota Law Review 714; Colleen V Chien, 'Holding Up and Holding Out' (2014) vol 21:1 Michigan Telecommunications and Technology Review 1; Anne Layne-Farrar, 'Why Patent Holdout is Not Just a Fancy Name for Plain Old Patent Infringement' (2016), available at: <http://www.crai.com/sites/default/files/publications/Why-Patent-Holdout-is-Not-Just-a-Fancy-Name-for-Plain-Old-Patent-Infringement.pdf>. EC, *Final Report on Patents and Standards: a Modern Framework for IPR-Based Standardization* (EU 2014) 123-124. Some indicate that there is no evidence of threat of patent holdup. In recent years the issue of patent holdout was recognized in several US judicial decisions, notably the US Federal Circuit's decision on *Apple Inc. v Motorola Mobility*. See *Apple Inc. v Motorola*, Inc. No. 12-1548 (Fed. Cir. 2014).

<sup>10</sup> Interoperability is defined as 'the ability of two or more networks, systems, devices, applications or components to exchange information between them and to use the information so exchanged'. See European Information and Communications Technology Industry Association (EICTA), *Interoperability White Paper* (June 2004). The White Paper elaborated the significance of interoperability for all stakeholders in the ICT sector. See WTO, *World Trade Report 2005* (n 4) 38-40; Keith Maskus and Stephen Merrill (eds) *Patent Challenges for Standard Setting in the Global Economy* (the National Academies Press 2001) 15-19; 25-26.

<sup>11</sup> The competitiveness of the ICT sector can be illustrated by competitive intensity in the smartphone operating system (OS) market. In 2009, this market was mainly shared by Symbian (as the first popular smartphone OS accounting for 48.8% of the market), RIM/Blackberry (20.6%), iOS (10.5%), Microsoft (10.2%), and Android (1.6%). Since 2011, Symbian was overtaken by Android and iOS, and in 2013 its market

and maintain competitive advantages in the ICT market, companies usually have to make intensive R&D efforts<sup>12</sup>, then patent the fruits of these efforts<sup>13</sup>, and later incorporate their patents into standards if possible.<sup>14</sup>

In order to produce standard-compliant products, competing companies have to obtain licences from patent holders. Unlike other industries, it is almost impossible or impractical for the competing company to design around SEPs to make its own products in the ICT sector.<sup>15</sup> If it is unable to obtain a fair and reasonable licence from the patent holder, the competing company would either have to withdraw from the market, or to agree to pay excessive royalties to the patent holder, or to ignore the patent and use the patented invention under the risk of infringement actions, especially the risk of injunctions. Some argue that the need for standard compliance and the risk of injunctions often strengthen the patent holder's position in licensing negotiations, especially in royalty negotiation, which raises the risk of patent holdup.<sup>16</sup> Others argue that there is little evidence of the existence of patent holdup in practice.<sup>17</sup>

Second, patent thickets are pronounced in the ICT sector, given the high rate of patent filing and its concentration in strategic technology areas, which exacerbates the issue of patent holdup and holdout. In the ICT sector, a single product can include thousands of patented technologies. As a striking example, in Long-Term Evolution (LTE) - a standard for wireless communication of high-speed data for mobile phones and data terminals, until 2011 some 3000 patents were declared by 35 companies to the ETSI.<sup>18</sup> Among these patents, there were more than 1000 SEPs, mainly owned by six companies.<sup>19</sup> In order to produce and market LTE-compliant products, producers need to obtain licences for the entire portfolio of SEPs. This often makes the royalty payment too high to be affordable; and also makes it difficult for the patent holder and the producer to reach licensing agreements.<sup>20</sup> On the one hand, the holdup of a single patent by the patent holder can easily block the production and marketing of the whole product.<sup>21</sup> On the other hand, it is arduous for the patent holder to track and litigate each potential patent holdout by the producer in such a big portfolio.<sup>22</sup> Therefore, patent thickets magnify the power of both patent holdup and holdout.

The aggravated tension between patents and standards in the ICT sector was evidenced by the proliferation of SEP-related investigations and litigations, especially in North America, Europe and Asia.<sup>23</sup> Most of the leading companies in the ICT sector have been involved in these cases, either as a patent holder or as an alleged patent infringer, exemplified in a series of litigations between

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sharply dropped to less than 1%. Nowadays, the market is shared between Android (84.1%) and iOS (14.8%). See Global Mobile OS Market Share in Sales to End Users from 1st Quarter 2009 to 1st Quarter 2016, available at: <http://www.statista.com/statistics/266136/global-market-share-held-by-smartphone-operating-systems/>

<sup>12</sup> Derek Aberle, 'Investing in Mobile Innovation' (Patent in Telecoms conference, Washington DC, November 2015).

<sup>13</sup> According to WIPO statistics on international patent applications under the Patent Cooperation Treaty (PCT), since 2000, the number of international patent applications relating to the ICT sector has increased at a growth rate which is higher than the average growth rate of international patent applications. Patent applications relating to the ICT sector include applications in the fields of electrical machinery, apparatus, energy; audio-visual technology; telecommunications; digital communication; basic communication processes; computer technology; and semiconductors. WIPO IP Statistics Data Centre, searchable at: <http://ipstats.wipo.int/ipstatv2/pmindex.htm?tab=pct>; See Fraunhofer, *Study on the Interplay between Standards and Intellectual Property Rights (IPRs) - Final Report* (April 2011) 41.

<sup>14</sup> EC, *Final Report on Patents and Standards* (n 9) 110-111. The report indicates the growing number of SEPs from 1995-2010. Fraunhofer, *Study on the Interplay between Standards and Intellectual Property Rights* (n 13) 33-35. The Study discovers that the distribution of SEPs is clearly very uneven: some SSOs attract large numbers of patents, others hardly any. The ICT-related standards, such as the standards of ISO, IEC, ETSI, IEEE, and ITU, attract a large number of SEPs.

<sup>15</sup> Lemley and Shapiro (n 9) 2016.

<sup>16</sup> Lemley and Shapiro (n 9) 1994-2010; 2016-2017.

<sup>17</sup> Sidak (n 9); Layne-Farrar (n 9).

<sup>18</sup> Cyber Creative Institute Co. Ltd, 'Evaluation of LET Essential Patent Declared to ETSI' (December 2011), available at: [www.cybersoken.com](http://www.cybersoken.com)

<sup>19</sup> *ibid.*

<sup>20</sup> EC, *Final Report on Patents and Standards* (n 9) 111-112.

<sup>21</sup> Lemley and Shapiro (n 9) 2010-2017.

<sup>22</sup> Chien (n 9).

<sup>23</sup> EC, *Final Report on Patents and Standards* (n 9) 125-126. The report shows that the number of SEP related litigations has increased rapidly from 1991 to 2011 and SEP-related litigations are about four times more than non-SEP related litigations. ITU, *Understanding Patents, Competition and Standardization in an Interconnected World* (ITU 2014) 61-62.

Apple Inc. and Samsung Electronics Co. Ltd in almost 12 countries, and a series of litigations between Motorola Mobility and Apple Inc. in the United States and Germany.

### 3 EXISTING POLICY MEASURES IN ADDRESSING PATENT HOLDUP AND PATENT HOLDOUT AND THEIR LIMITATIONS

The aggravated tension between patents and standards has provoked heated debate on patent holdup and holdout in the ICT sector, and attracted much attention from SSOs, industry bodies, as well as judicial and administrative authorities. A series of policy measures have been undertaken to ease this tension. While these measures help deter patent holdup and holdout to a certain extent, each of them has its own limitations, especially in addressing the fundamental issue of patent holdup and holdout: what are fair, reasonable and non-discriminatory (FRAND) terms and conditions for the use of SEPs, or more specifically what are FRAND royalties for SEPs?

#### 3.1 The requirements of disclosure of patent information and FRAND commitments

The requirements of disclosure of patent information and FRAND commitments are used by a number of SSOs to improve the transparency of the standard setting process. A typical example is the Common Patent Policy for International Telecommunication Union - Radiocommunication Sector (ITU-R) and Standardization Sector (ITU-T), International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) (Common Patent Policy).<sup>24</sup>

Under the disclosure requirement of the Common Patent Policy, parties involved in the standard setting process are obligated to disclose patent information, either their own or others' granted patents or their patent applications, known to be relevant to a proposed standard.<sup>25</sup> The disclosure requirement is to inform SSOs and their members of the patent status of technology. It enables SSOs to avoid incorporating patented technology into standards, except where the technology is "essential" to implement the standard and when such incorporation is acceptable to prospective implementers of the standard. A well-designed disclosure requirement can eliminate the issue of patent holdup caused by a so called "hidden patent". A typical case is the patent holdup by Dell Computer Corp. (Dell) in the implementation of the Video Electronics Standards Association's (VESA) Local-Bus (VL-bus) standard.<sup>26</sup>

Under the requirement of FRAND commitments in the Common Patent Policy, if a standard contains a patented technology, the patent holder should agree to authorize licences to all prospective implementers of the standard, either for free or on FRAND terms and conditions.<sup>27</sup> If the patent holder is unwilling to grant FRAND licences, the SSO should not include the patent in the standard.<sup>28</sup> The requirement of FRAND commitments is expected to avoid controversy over licensing terms and conditions, especially royalties, between patent holders and standard implementers during the implementation of the standard. In particular, the non-discriminatory requirement intends to avoid undue discrimination against similarly situated standard implementers in their licensing negotiations. While ensuring that the patent holder will receive appropriate royalties for his R&D investment and contribution to the standard, the requirement of FRAND commitments also ensures that the standard implementer will not be overcharged for use of the SEP.

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<sup>24</sup> ISO, IEC and ITU are the three largest and best known international standard setting bodies. They had their own patent policies for many years before they jointly issued the ISO-IEC-ITU-T Common Patent Policy (Common Patent Policy) in 2006 and the Guidelines for Implementation of the Common Patent Policy (the Guidelines) in 2007. In 2012, the Guidelines have been amended. Common Patent Policy, available at: <http://www.itu.int/en/ITU-T/ipr/Pages/policy.aspx>; and the Guidelines, available at: [http://www.iec.ch/members\\_experts/tools/patents/documents/ITU-T\\_ITU-R\\_ISO\\_IEC\\_Common\\_Guidelines.pdf](http://www.iec.ch/members_experts/tools/patents/documents/ITU-T_ITU-R_ISO_IEC_Common_Guidelines.pdf)

<sup>25</sup> Common Patent Policy (n 24) para 1; The Guidelines (n 24) para 3.

<sup>26</sup> Dell was a member of the VESA, a non-profit SSO. During VESA's development of the VL-bus standard, Dell affirmed to the VESA that to the best of its knowledge, the proposed VL-bus standard did not infringe on any patents owned by Dell. After the adoption of the VL-bus standard, Dell claimed its patent was incorporated into the VL-bus standard and accused the standard implementers of violation of its patent. The US Federal Trade Commission (FTC) charged Dell that its actions were unfair and unreasonably restrained competition. See Dell Computer Corp., 12 F.T.C. 616 (1996) available at: <https://www.ftc.gov/enforcement/cases-proceedings/931-0097/dell-computer-corporation>; See Christopher R Leslie, *Antitrust Law and Intellectual Property Rights: Cases and Materials* (2011), ch 8.

<sup>27</sup> Common Patent Policy (n 24).

<sup>28</sup> *ibid* para 2.3.

While many SSOs now have their own patent policies on the requirements of disclosure and FRAND commitments, these policies vary significantly.<sup>29</sup> With respect to the disclosure requirement, substantive differences exist in the following areas: nature of the disclosure requirement (mandatory vs. voluntary); the scope of object of disclosure (granted patents vs. patent applications; SSO parties' own patents vs. any patents known to SSO parties; and essential patents vs. all relevant patents); definition of "essentiality"; trigger for the disclosure requirement; timing of disclosure; and availability of disclosed patent information (only to SSO members vs. to the general public).<sup>30</sup> These variations, together with SSO patent policies' ambiguous languages in themselves, undermine the efficiency of the disclosure requirement in improving the transparency of the standing setting process.

Regarding the requirement of FRAND commitments, SSOs usually have different rules on two crucial issues: whether FRAND commitments should be considered as a commitment to grant royalty-free licences, or as a commitment to grant FRAND priced licences,<sup>31</sup> and whether FRAND commitments should be binding on a third party, especially non-SSO Member parties, upon the transfer of the ownership of SEPs to them.<sup>32</sup> Furthermore, none of the SSOs provides detailed explanations of the meaning of FRAND commitments, not to mention the lack of a common understanding among the SSOs.<sup>33</sup> Some argue that the meaning of FRAND commitments should be settled among the parties concerned. However, the parties concerned may be unable to reach an agreement on FRAND terms and conditions in practice. As a result, the lack of clear meaning of FRAND commitments makes the enforceability of FRAND commitments problematic. It is easy to make a patent holder to undertake FRAND commitments during the standard setting process, but it is hard to enforce such commitments once the standard is settled. Eventually, the risk of patent holdup caused by a hidden patent, which is addressed by the disclosure requirement to a certain extent, is replaced by the risk of patent holdup caused by the hidden licensing terms and conditions. In other words, the efficiency of the disclosure requirement is undermined by the unenforceability of FRAND commitments.

### 3.2 Ex-ante disclosure of licensing terms and conditions

Ex-ante disclosure of licensing terms and conditions is another mechanism used by SSOs to enhance the transparency of the standard setting process and reduce to the risk of patent holdup. Under the ex-ante disclosure requirement, patent holders are either obliged or encouraged to disclose royalties and other licensing terms and conditions before their patents are incorporated into standards. For example, VITA Standard Organization (VSO) is the only SSO having a mandatory ex-ante disclosure requirement, while ETSI's patent policy only allows for voluntary ex-ante disclosure of licensing terms and conditions in the standard setting process.<sup>34</sup>

The ex-ante disclosure requirement may be used to address the issue of hidden licensing terms and conditions and therefore further improve the openness and transparency of the standard setting process.<sup>35</sup> However, concerns have been raised over its possible negative effects on the standard setting process. For example, it was asserted that the ex-ante disclosure requirement could cause unnecessary delay in the standard setting process and undermine incentives for the industry to participate in the standard setting process and to incorporate best patented technology

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<sup>29</sup> For example, in addition to these three SSOs, the European Telecommunications Standards Institute (ETSI), the Institute of Electrical and Electronics Engineers - Standard (IEEE), the American National Standards Institute (ANSI), the European Committee for Standardization (CEN), and the World Wide Web Consortium (W3C) have also established their own patent policies. Mark Lemley, 'Intellectual Property Rights and Standard Setting Organizations' (2000) vol 90 California Law Review 1889; Maskus and Merrill (n 10) 36-44. EC, *Final Report on Patents and Standards* (n 9) 45-46.

<sup>30</sup> Lemley (n 29) 1904-1906; 1973-1975; Maskus and Merrill (n 10) 31-44; 71-72. EC, *Final Report on Patents and Standards* (n 9) 40-46.

<sup>31</sup> Lemley (n 29) 1904-1906; 1973-1975; Maskus and Merrill (n 10) 44.

<sup>32</sup> Maskus and Merrill (n 10) 47-48; ITU, *Understanding Patents, Competition and Standardization in an Interconnected World* (n 23) 70.

<sup>33</sup> Lemley (n 29) 1889; Maskus and Merrill (n 10) 49.

<sup>34</sup> See VITA 'VSO Polices and Procedures' Revision 2.8 (September 1 2015); ETSI ex-ante disclosure of licensing terms, available at: <http://www.etsi.org/about/how-we-work/intellectual-property-rights-ipsr/ex-ante-disclosures>;

<sup>35</sup> Jorge L. Contreras, 'An Empirical Study of the Effects of Ex Ante Licensing Disclosure Policies on the Development of Voluntary Technical Standards' (2011) NIST Contract No. SB134110SE1033, available at: [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1916743](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1916743)

into standards.<sup>36</sup> It has also been contended that while the ex-ante disclosure requirement undermines the negotiating power of the patent holder, it might give too much power to other parties concerned and therefore raise the risk of patent holdout.<sup>37</sup>

In addition, it is argued that it might be difficult for the patent holder or other parties to forecast the market and to predict FRAND licensing terms and conditions, especially royalties, during the standard setting process. If the licensing terms and conditions are the outcome of ex-ante negotiations between the patent holder and other parties involved in the standard setting process, it may be considered as price fixing negotiations, which will be subject to the close scrutiny of competition agencies.<sup>38</sup>

### 3.3 Limits on the availability of injunctions and exclusion orders<sup>39</sup>

Injunctions/exclusion orders are an important IP enforcement mechanism used by national judicial and administrative agencies to address the issue of patent holdup and holdout. National judicial or administrative authorities usually have the power to order an alleged IP infringer to cease infringing activity. In recent years, there has been a significant increase in the number of requests for injunctions/exclusion orders for SEPs, typically used by patent holders to request the ban of the sale and importation of SEP-incorporated products in domestic markets.<sup>40</sup>

This has led to an intensive debate on whether the availability of injunctions/exclusion orders should be limited when SEPs are subject to FRAND commitments.<sup>41</sup> Some argue that once patent holders make FRAND commitments, it should be presumed that the patent holder will only pursue royalty remedies, and will not pursue injunctions/exclusion orders in cases of SEP infringement. Others argue that FRAND commitments should not result in limiting the patent holder's right to seek injunctions/exclusion orders against patent infringement.<sup>42</sup> In the last few years, several judicial and administrative decisions in the United States, Europe and Asia, illuminate the discussion of the appropriate availability of injunctions/exclusion orders.<sup>43</sup>

In January 2013, the US Patent and Trademark Office (USPTO) and the US Department of Justice (DOJ) issued a joint policy statement on remedies for SEPs subject to FRAND commitments (the Joint Statement).<sup>44</sup> The Joint Statement provides the USPTO and DOJ's perspectives on the use of injunctions by US courts and exclusion orders by US International Trade Commission (ITC), while recognizing the four-factor rule set up by the US Supreme Court for obtaining injunctions in the case of *EBay Inc. v. MercExchange L.L.C.*<sup>45</sup> According to the Joint Statement, injunctions/exclusion orders for infringement of SEPs subject to FRAND commitments might not be an appropriate

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<sup>36</sup> *ibid* 5-7. Fraunhofer, *Study on the Interplay between Standards and Intellectual Property Rights* (n 13) 26.

<sup>37</sup> *ibid.*

<sup>38</sup> *ibid*

<sup>39</sup> For the purpose of this paper, the use of the term 'injunctions' refers to permanent injunctions only. In other words, preliminary or interim injunctions which are available in some jurisdictions are not covered.

<sup>40</sup> Maskus and Merrill (n 10) 100.

<sup>41</sup> A typical example is a series of litigations between Microsoft Corp. and Motorola Inc. in the United States and Germany. In these litigations, the German court issued an injunction in favour of Motorola against Microsoft's sale of allegedly infringing products in Germany. The US District Court subsequently granted an anti-suit injunction to Microsoft preventing Motorola from enforcing the injunction issued by the German court. *Microsoft Corp. v Motorola Inc.*, 2:10-cv-01823-JLR, 871 F. Supp. 2d 1089 (W.D. Wash. 2012). The decision was appealed to the US Court of Appeals for the Ninth Circuit, which affirmed the District Court's decision on the anti-suit injunction. *Microsoft Corp. v Motorola Inc.*, 696 F.3d 872 (9th Cir. 2012).

<sup>42</sup> In 1993 ETSI patent policy indicated automatic licensing, licensing by default, and injunction waiver, which was strongly protested by some companies. 安伯生, '标准必要专利 FRAND 许可辨析'《专利法研究 2014》(国家知识产权局条法司编 知识产权出版社 2014); Maskus and Merrill (n 10) 101.

<sup>43</sup> AIPPI, 'Special Committee on Patents and Standards Report Work Plan Item 5: Availability of Injunctive Relief for FRAND-Committed Standard Essential Patents' (March 2014); Maskus and Merrill (n 10) 101, 107.

<sup>44</sup> United States Department of Justice and United States Patent and Trademark Office: Policy Statement on Remedies For Standards-Essential Patents Subject to Voluntary F/Rand Commitments (the Joint Statement), available at: USPTO website [https://www.uspto.gov/about/offices/ogc/Final\\_DOJ-PTO\\_Policy\\_Statement\\_on\\_FRAND\\_SEPs\\_1-8-13.pdf](https://www.uspto.gov/about/offices/ogc/Final_DOJ-PTO_Policy_Statement_on_FRAND_SEPs_1-8-13.pdf)

<sup>45</sup> The four-factor rule requires a plaintiff to demonstrate that: (1) it has suffered an irreparable injury; (2) remedies available at law are inadequate to compensate for that injury; (3) considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and (4) the public interest would not be disserved by a permanent injunction. *eBay Inc. v MercExchange, L.L.C.* 547 U.S. 338 (2006).

remedy for SEP holders in certain circumstances, such as when the SEP holder intends to use such injunctions/exclusion orders to push standard implementers to accept licensing terms contrary to the FRAND commitments, as this would be inconsistent with the public interest.<sup>46</sup> Accordingly, the Joint Statement recommends caution in granting injunctions/exclusion orders, while ensuring that the SEP holder receives appropriate compensation for his SEP technology.<sup>47</sup>

In April 2014, the US Court of Appeals for the Federal Circuit (Federal Circuit) issued its decision on a longstanding dispute between Apple Inc. and Motorola, Inc.. While it affirmed the district court's dismissal of Motorola's claims for injunctions, the Federal Circuit expressed its concern over the district court's conclusion that, in general, injunctions should not be available to SEPs that are subject to FRAND commitments. Instead, it indicated that there is no *per se* rule that precludes a SEP holder from seeking injunctions because of his FRAND commitments and that the four-factor rule set out in the eBay case provides "ample strength" and "flexibility" for addressing the SEP issue. In particular, it might be difficult for a SEP holder to prove that he "has suffered an irreparable injury", when the accused infringer did not unilaterally refuse FRAND licensing terms and conditions or did not unreasonably delay negotiation.<sup>48</sup>

In July 2015, the Court of Justice of the European Union (CJEU) made its preliminary ruling on the dispute between Huawei Technologies Co. Ltd and ZTE Group upon the request of the German district court (Landgericht Düsseldorf).<sup>49</sup> In its ruling, the CJEU clarified two alternative circumstances in which a SEP holder's request for an injunction is not considered as an abuse of its dominant position under Article 102 TFEU.<sup>50</sup> First, before requesting an injunction, the SEP holder has alerted the alleged infringer of the infringement by identifying the SEP and specifying how it has been infringed; and the alleged infringer has not expressed its willingness to conclude a FRAND licensing agreement.<sup>51</sup> Second, after the alleged infringer expressed its willingness to conclude such a FRAND agreement, the SEP holder has presented the alleged infringer with a specific, written offer, in particular specifying royalties and calculation methods. However, the alleged infringer does not diligently respond to the offer in accordance with recognized commercial practices in the field and continues to use the SEP.<sup>52</sup> In other words, after receiving the specific written offer from the SEP holder, the alleged infringer fails to respond diligently because of lack of good faith and/or use of delaying tactics.<sup>53</sup>

In May 2014, in the dispute between Apple Inc. and Samsung Electronics Co., Ltd, the Intellectual Property High Court of Japan stated that the SEP holder seeking the injunction would be considered as an abuse of his patent rights, if the SEP user has expressed his intention to obtain a voluntary licence based on the SEP holder's offer.<sup>54</sup>

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<sup>46</sup> The Joint Statement (n 44).

<sup>47</sup> The Joint Statement (n 44).

<sup>48</sup> See *Apple Inc. v Motorola, Inc.*, No. 12-1548, -1549 (Fed. Cir. Apr. 25, 2014).

<sup>49</sup> CJEU, Case C-170/13, *Huawei Technologies Co. Ltd and ZTE Group* (2015) ECR I-1. The dispute was over the infringement of Huawei's European patent, which is essential to the implementation of the Long Term Evolution (LTE) standard established by ETSI. Under the ETSI Intellectual Property Right Policy, Huawei notified ETSI of its patent and made FRAND commitments. Without reaching an agreement on royalty payment to Huawei, ZTE marketed LTE compliant products by using Huawei's SEP. In April 2011, Huawei brought a case against ZTE seeking an injunction prohibiting ZTE's infringement of its SEP, the rendering of accounts and the recall of products and award of damages. The issue facing the CJEU was whether Huawei's action for injunction was to be considered as an abuse of a dominant position under Article 102 TFEU and accordingly, whether Huawei action should be dismissed. Under Article 102, 'any abuse by one or more undertakings of a dominant position within the internal market or in a substantial part of it shall be prohibited as incompatible with the internal market in so far as it may affect trade between Member States.' Such abuse may, in particular, consist in: (a) directly or indirectly imposing unfair purchase or selling prices or other unfair trading conditions; (b) limiting production, markets or technical development to the prejudice of consumers; (c) applying dissimilar conditions to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage; (d) making the conclusion of contracts subject to acceptance by the other parties of supplementary obligations which, by their nature or according to commercial usage, have no connection with the subject of such contracts." Landgericht Düsseldorf 4b O 104/12.

<sup>50</sup> It should be noted that the ruling is merely the CJEU's interpretation of Article 102 TFEU as a matter of principle and it still leaves the German Court to apply the ruling to the dispute.

<sup>51</sup> Case C-170/13, *Huawei Technologies Co. Ltd and ZTE Group* (2015) ECR I paras 59-71.

<sup>52</sup> *ibid.*

<sup>53</sup> *ibid.*

<sup>54</sup> Maskus and Merrill (n 10) 95-100. Takanori Abe, 'IP High Court Rules in Apple v Samsung FRAND Case' (September 2014) MANAGINGIP, available at: <http://www.abe-law.com/article/140819MIParticle.pdf>.

To limit the availability of injunctions/exclusion orders can, to a certain extent, undermine the negotiating power of patent holders and therefore reduce the risk of patent holdup. Meanwhile, it also safeguards the patent holder against users' abuse of these limitations, thus reducing the risk of patent holdout. However, there are still a number of legal and practical questions as to how to apply these limitations in practice, such as who bears the legal burden to provide sufficient evidence of patent holdup or holdout<sup>55</sup>, in order to balance the negotiating powers of the patent holder and the patent user, and to encourage good faith negotiations.<sup>56</sup>

### 3.4 Open standards

Open standards is a mechanism used by governments to address the issue of patent holdup and holdout. There is no universal definition of open standard. In general, an open standard includes, but is not limited to, the following elements: (1) the standard is developed, approved and/or maintained by a collaborative and transparent consensus-based process, which is reasonably open to all interested parties; (2) the standard has an open source, and is published and made available to the general public; and (3) the standard is subject to FRAND commitments, which do not mandate, but encourage, patent holders, to license their patents without compensation.<sup>57</sup> A typical open standard in the ICT sector is the World Wide Web Consortium (W3C). Under the W3C patent policy, recommendations are subject to free access during the development of standards, and they should be implemented on a royalty-free basis.<sup>58</sup>

In 2007, Denmark notified the WTO TBT Committee of the Agreement on the Use of Open Standards for Software in the Public Sector. According to the Agreement, after 1 January 2008, all new IT solutions in the public sector must be based on or be able to support the use of the specified open standards in Denmark with a number of specified exceptions.<sup>59</sup>

It is believed that open standards help avoid patent holdup by making the standard free of patent protection or royalty charge. However, the main concern over open standards is that the requirement of free open source or free licensing commitments will undermine incentives for the industry to develop new technology, disclose the technology in time, and incorporate the technology in the standard setting process.<sup>60</sup>

### 3.5 Patent pools

A patent pool is an agreement among SEP holders, enabling these holders to grant cross-licences to each other and to grant a licensing package to outside standard implementers so as to avoid patent holdup and holdout. A patent pool is usually managed by patent holders themselves or by an independent company, who negotiate licensing terms and conditions on behalf of all pool members and then distribute licensing fees among them. Typical examples of patent pools include the licensing programs managed by the Licensing Authorities of the Movie Picture Expert Group (MPEG-LA), Via Licensing, and Sisvel.<sup>61</sup>

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<sup>55</sup> J Gregory Sidak, 'International Trade Commission Exclusion Orders for the Infringement of Standard-Essential Patents' (21 May 2016), available at: <https://www.criterioneconomics.com/docs/itc-exclusion-orders-for-standard-essential-patents.pdf>.

<sup>56</sup> Sidak (n 55); Maskus and Merrill (n 10) 110.

<sup>57</sup> The IEEE, Internet Society (ISOC), W3C, Internet Engineering Task Force (IETF) and Internet Architecture Board (IAB) Joint Statement of Affirmation, which sets up five fundamental principles of standard development by SSOs: due process, broad consensus, transparency, balance, and openness. It also provides that standards are made accessible to all for implementation and deployment. available at: <https://open-stand.org/about-us/principles/>.

<sup>58</sup> W3C Patent Policy (5 February 2004), Section 5: W3C Royalty-Free (RF) Licensing Requirements.

<sup>59</sup> Under the Agreement, open standard is defined to include the following elements: (1) the standard must be publicly accessible and documented in all its details; (2) the standard must be freely implementable without economic, political or judicial constraints on implementation and use, now or in the future; and (3) the standard must be standardized and maintained in an open forum via an open process (organisation for standardisation). WTO, 'Committee on Technical Barriers to Trade - Notification' (4 December 2007) G/TBT/N/DNK/73.

<sup>60</sup> See the Joint Statement (n 44). It indicates that 'the US continues to encourage systems that support voluntary FRAND licensing rather than the imposition of one-size-fits-all mandates for royalty-free or below-market licensing, which would undermine the effectiveness of the standardization process and incentives for innovation'.

<sup>61</sup> MPEG standards (a set of standards for audio and video compression and transmission) were developed by the Moving Picture Experts Group (MPEG) in ISO and IEC. MPEG LA, LLC was established in 1997

In theory, a patent pool helps reduce patent holdup and holdout among the companies that have patent portfolios in a standard and are in the same negotiating positions as they can grant cross licences to each other. A patent pool also facilitates licensing negotiations between patent holders and outside standard implementers as the pool can act as a one-stop shop where the outside standard implementer can have a single royalty rate for all SEPs. It can therefore reduce transaction costs and increase certainty for both the patent holder and the standard implementer.<sup>62</sup> Nevertheless a patent pool may itself constitute a barrier to competing companies to access SEPs, as the licensing terms and conditions offered by the pool may not necessarily be fair and reasonable to the outside standard implementer. For example, in 2003, a large number of DVD-player manufacturers in Asia complained that the royalties charged by MPEG-LA for the MPEG-2 patent pool were too high to be affordable so that they were finally forced to withdraw from the market.<sup>63</sup>

In addition, one of the main challenges facing patent pools is how to deal with different commercial interests among SEP holders, especially in terms of determining royalty rates and apportioning the royalty payment between SEP holders. If a SEP holder's interest is not fully satisfied by the pool, he may decide not to participate in the pool or establish another pool.<sup>64</sup> If there is more than one patent pool for a standard or a pool lacks the participation of main SEP holders, the purpose of the establishment of a patent pool, namely to reduce the costs, complexity and uncertainty of SEP licensing, will certainly be undermined.<sup>65</sup>

### 3.6 Competition policy

There is a longstanding debate on the interplay between intellectual property (IP) and competition policy. Nowadays it seems widely accepted that IP and competition policy can be complementary to each other in terms of promoting innovation and market competition. It seems to be understood that exploitation of IP rights (IPRs), including the refusal to license IPRs, is legitimate use and does not amount in itself to being anticompetitive.<sup>66</sup> However, if IPRs are misused to the detriment of market competition, competition law should then be applied.<sup>67</sup>

In practice, competition law has been used frequently in addressing patent holdup, especially in deciding whether a SEP holder seeking injunctions for SEP infringement should be considered to be abusing his dominant position under competition law.<sup>68</sup> For example, in Europe, patent holdup may raise concerns about anticompetitive conduct under Article 102 of the TFEU, if the refusing patent holder has a dominant position in the market, and the refusal to license constitutes an abuse of such a dominant position and has a negative effect on the degree of competition in the market.<sup>69</sup> In the United States, under Section 2 of the Sherman Antitrust Act and Section 5 of the Federal Trade Commission Act, if a patent holder possesses monopoly power in the market and he acquires or maintains this power through anticompetitive actions wilfully, the action should be

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to manage MPEG patent pools. Via Licensing, available at: <http://www.via-corp.com/index.html>; Sisvel, available at: <http://www.sisvel.com/>.

<sup>62</sup> EC, *Final Report on Patents and Standards* (n 9) 173.

<sup>63</sup> Lei Mei, 'Licensing Intellectual Property in China' (2014) vol 10 Patent Litigation in China 43-44.

<sup>64</sup> For example, Via Licensing Corp established the first patent pool for the 4G LTE standard, and Sisvel set up another patent pool for the LTE. The members of these two pools are different from each other. Sisvel LTE patent pool members include Airbus DS SAS, Bräu Verwaltungsgesellschaft mbH, China Academy of Telecommunication Technology (CATT), Electronics and Telecommunications Research Institute (ETRI), Koninklijke KPN N. V., Orange SAS, and TDF SAS. Available at: <http://www.sisvel.com/lte-ltea/patent-holders>, visited on August 2016. Via Licensing Corp LTE pool participants include Google, AT&T, China Mobile, Clear Wireless, Deutsche Telekom, DTVG Licensing, Hewlett-Packard, KDDI, NTT DOCOMO, SK Telecom, and Telecom Italia, Telefonica and ZTE Corp. available at: <http://www.via-corp.com/newsdetail.aspx?id=1716>. Interestingly, the main SEP owners, such as Qualcomm, Ericsson, InterDigital, Samsung, Motorola, ZTE, Nokia, and Huawei, are not members of either of the pools.

<sup>65</sup> Michelle Donegan, 'LTE Patent Pools: Two's a Crowd', available at: <http://www.lightreading.com/mobile/4g-lte/lte-patent-pools-twos-a-crowd/a/d-id/699481>

<sup>66</sup> WIPO, 'Refusals to Licence IP Rights – A Comparative Note on Possible Approaches' (August 2013).

<sup>67</sup> *ibid.*

<sup>68</sup> Urska Petrovčič, 'Patent Hold-up and the Limits of Competition Law: A Trans-Atlantic Perspective' (2013) vol 50/no 5 Common Market Law Review 1363.

<sup>69</sup> The Treaty on the Functioning of the European Union (2007) art 102.

condemned.<sup>70</sup> In China, under the Anti-Monopoly Law and the Provisions on Prohibiting of Abuse of Intellectual Property Rights to Exclude or Restrict Competition, if a SEP holder, who has a dominant market position, refuses to license the SEP under FRAND terms and conditions, makes tie-in arrangements in licensing SEP, or appends unreasonable trade conditions to the licensing agreement, it should be considered as anticompetitive.<sup>71</sup>

While competition law plays a certain role in addressing patent holdup, there are still many uncertainties surrounding its application in practice.<sup>72</sup> First, there is no internationally accepted list of IP-related licensing practices or conditions which are considered illegal *per se* and therefore should be prohibited. National competition laws vary significantly in terms of what kind of licensing practices or conditions constitute abuse of IPRs and have an adverse effect on market competition. For instance, the legislation of the EU and China focuses on the abuse of dominant position, while US legislation pays particular attention to anticompetitive ways in obtaining and maintaining monopoly power.<sup>73</sup> Given these differences, some patent holdups may be legal under one jurisdiction, but condemned under others.<sup>74</sup>

Second, competition law decisions are often subject to rule of reason analysis, largely based on competition agencies' assessments of facts, such as dominant position, scope of relevant product market, and excessive royalty charges. Regarding the assessment of excessive royalty charges, it might not be desirable for competition agencies to be involved in deciding what FRAND royalties are, which should be largely left to the parties concerned and judicial authorities if the parties cannot reach an agreement.<sup>75</sup> For example, the Chinese National Development and Reform Commission (NDRC) made its administrative decision on Qualcomm's anticompetitive licensing practices in 2015. In its decision, the NDRC found that Qualcomm held a dominant position in the licensing market for SEPs for CDMA, WCDMA and LTE wireless communications, and that Qualcomm abused its dominance by charging royalties for its expired SEPs, requiring licensees to grant-back royalty-free licences for the licensees' patents, and bundling the sale of non-SEPs with SEPs without reasonable justification. In the light of Article 47 of the Chinese Anti-Monopoly Law<sup>76</sup>, the NDRC ordered Qualcomm to cease the aforementioned illegal abuses of its dominant position within the territory of China, and imposed a fine of 8 per cent of Qualcomm's turnover within the territory of China in 2013.<sup>77</sup> However, in its decision, the NDRC did not take its position on whether Qualcomm charged unfairly high royalties for its valid SEPs and what FRAND royalties were for these SEPs.

In addition, competition agencies' decisions are often subject to their interpretations of exemptions and exceptions for certain economic activities under domestic competition law. For example, in China, a "monopoly" agreement can be exempted if it can be proven that the agreement is for the purpose of safeguarding the justifiable interests in the foreign trade or foreign economic cooperation.<sup>78</sup> These exemptions and exceptions can be considered as leeway, which is necessarily

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<sup>70</sup> Sherman Antitrust Act §2; Federal Trade Commission Act Section 5: Unfair or Deceptive Acts or Practices; USDOJ and USITC, Antitrust Guidelines for the Licensing of Intellectual Property (April 6, 1995), available at: <https://www.justice.gov/atr/antitrust-guidelines-licensing-intellectual-property>

<sup>71</sup> Anti-Monopoly Law of the People's Republic of China, arts 13 and 14; Provisions on Prohibiting the Abuse of Intellectual Property Rights to Preclude or Restrict Competition, issued by Order No. 74 of the Chinese State Administration for Industry and Commerce (SAIC) (7 April 2015) arts 4 and 13.

<sup>72</sup> George S Cary, Mark W Nelson, Steven J Kaiser, and Alex R Sistla, 'The Case for Antitrust Law to Police the Patent Holdup Problem in Standard Setting' (2011) vol 77/no 3 Antitrust Law Journal 913.

<sup>73</sup> Petrovčič (n 68).

<sup>74</sup> *ibid.*

<sup>75</sup> Alden F Abbott, 'IP Litigation and Remedies, a US FTC Perspective' (IBC Legal Conferences' 56th Annual Stands and Patents 2011, London, November 2011) In his presentation, he indicated that three factors should be kept in mind in assessing remedies in patent litigation: (1) government should be neutral as to business models, same objective antitrust analysis for all; (2) antitrust agencies should not be price regulators; and (3) government should not pick winners and losers. See Petrovčič (n 68) 1385; WIPO 'Refusals to Licence IP Rights – A Comparative Note on Possible Approaches' (n 66) paras 26-36.

<sup>76</sup> Under Article 47 of Anti-Monopoly Law of the PRC, where an undertaking abuses its dominant market position, the authorities shall instruct it to discontinue the abusing, confiscate its unlawful gains, and impose on it a fine of not less than one percent but not more than 10% of its sales achieved in the previous year.

<sup>77</sup> National Development and Reform Commission of China, Administrative Penalty Decision, 发改办价监处罚 [2015] 1号.

<sup>78</sup> Anti-Monopoly Law of the PRC, art 15; EU's Technology Transfer Block Exemption Regulations (TTBE); US FTC and US DOJ, Antitrust Guidelines for Collaborations Among Antitrust, Section 4 Antitrust Safety Zones; US FTC and DOJ, Antitrust Guidelines for the Licensing of Intellectual Property, Section 4.3 Antitrust safety Zones.

left to competition agencies to make their decisions. However, they also contribute to the uncertainty of the application of competition law. In sum, competition policy plays a limited role in addressing the issue of patent holdup, especially in addressing the abuse of IPRs by charging excessive royalties.<sup>79</sup>

### 3.7 Compulsory licensing

Compulsory licences are licences issued by competent government authorities instead of patent holders. Compulsory licensing is normally used by a country to promote the public interest, such as to protect public health or to remedy anticompetitive practices. While most national patent laws have provisions on compulsory licensing, its use always raises strong concerns in the industry over its negative effect on the patent system.<sup>80</sup> For example, in July 2004, Chinese Taipei issued compulsory licences for five patents owned by a multinational company to a CD-R manufacturing company in Chinese Taipei. These five patents were essential for producing CD-Rs compliant with the technical standards.<sup>81</sup> After the issue of the compulsory licences, the patent owner appealed the case through administrative and judicial procedures in Chinese Taipei and also requested the European Commission to conduct an investigation of these compulsory licences.<sup>82</sup> It should be noted that, under compulsory licensing, the licensee still needs to pay adequate remuneration to the patent holder for such use. Therefore, the question of what are FRAND terms and conditions is replaced by the question of what is adequate remuneration, which still needs to be decided by governmental authorities and then reviewed by judicial authorities.

### 3.8 Current debate

Given the limitations of existing policy measures mentioned above, the focus of the debate on the interplay between patents and standards has been gradually shifting to appropriate valuation of SEPs in recent years. The appropriate valuation of SEPs has never been an easy task. In practice almost all the litigations and investigations ultimately concern what are FRAND terms and conditions, in particular what FRAND royalty rates are. In the last three years, several important judicial decisions have been made in the United States, India, Japan and China, shedding light on the methods used by the courts in the calculation of FRAND royalties, especially these courts' views on several key questions: whether FRAND royalties should be determined by a SEP's technical contribution to a product or its contribution to a standard; whether a SEP holder should benefit from the demand for the product created by patented technology *per se* or the demand created by the adoption of a standard; whether the determination of FRAND royalties should take into account differential royalties for different markets in the light of the economic development and size of the market; and whether royalties should be based on the sales price of the end product or the price of the smallest component incorporating SEP technology.

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<sup>79</sup> Petrović (n 68); WIPO, 'Refusals to Licence IP Rights – A Comparative Note on Possible Approaches' (n 66).

<sup>80</sup> Jinzo Fujino, 'Compulsory Licenses for Essential Patents: Emerging Need in the ICT Sector' *Journal of Standards and Standardization* 2011 79-89. (표준과 표준화 연구 제 1 권 제 1 호)

<sup>81</sup>In 2001 and 2012, Gigastorage (a CD-R producer in Chinese Taipei) tried to negotiate licensing agreements with Koninklijke Philips N.V. (Philips) on Philips' five patents, mainly to reduce the royalty rate from 3 % to 2.5% of the net sales price given the decreasing market price of CD-Rs. After failing to negotiate voluntary licences with Philips, Gigastorage submitted to Intellectual Property Office (TIPO) of Chinese Taipei an application for compulsory licences for five patents owned by Philips. In 2004, TIPO issued the compulsory licences under Article 76 of the Patent Act, which was appealed to the Administrative High Court of Chinese Taipei by Philips. In 2006, Gigastorage stopped manufacturing CD-Rs, and asked TIPO to terminate the compulsory licences. Meanwhile Philips also requested the TIPO to terminate the compulsory licences as Gigastorage exported more than 50% of its CD-R products to foreign markets. In May 2007, the TIPO annulled the compulsory licences based on the request of Gigastorage.

<sup>82</sup> On 30 January 2008, the European Commission released its report to the Trade Barriers Regulation Committee upon the complaint submitted by Koninklijke Philips Electronics N.V.. The report indicated that TIPO's decision regarding the grant of compulsory licences was inconsistent with the WTO TRIPS Agreement, especially Article 31(b), (c) and (f). It recommended that the Commission should start WTO proceedings if Chinese Taipei did not take concrete steps to amend its Patent Law and reverse the compulsory licence decisions against Philips within two months. EC, 'Report to the Trade Barriers Regulation Committee: Examination Procedure Concerning an Obstacle to Trade, within the Meaning of Council Regulation (EC) No 3286/94, Consisting of Measures Adopted by the Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu Affecting Patent Protection in Respect of Recordable Compact Discs, Complaint Submitted By Koninklijke Philips Electronics N.V TBR: Investigation Report Non-Confidential Version' (8 January 2008) (referred to as EC Report on CD-R).

In the United States, in April 2013, the District Court for the Western District of Washington delivered a benchmark decision on the dispute between Microsoft and Motorola on royalties for WLAN standard and video compression technology standard, providing important guidance on how to apply the Georgia-Pacific factors in calculating FRAND royalties for SEPs.<sup>83</sup> The decision indicated that, as basic principles, the calculation of FRAND royalties should be consistent with SSOs' goal of promoting the widespread adoption of standards, and should recognize and seek to mitigate the risk of patent holdup and address the risk of royalty stacking.<sup>84</sup> It also pointed out that FRAND royalties should ensure that a patent holder receives reasonable royalties, based on the economic value of patented technology itself but for the value associated with the incorporation of the patented technology into the standard.<sup>85</sup>

In India, the High Court of Delhi made two interim judgements on the disputes between Ericsson and Micromax and Intex respectively on the royalties for Ericsson's SEPs to 2G and 3G standards in 2014. The Court based the royalty calculation on the net sales price of downstream products and made reference to comparable licences in the Indian market. It should be noted that this method was contrary to the method used by the Competition Commission of India in its anti-competition investigation of these two cases.<sup>86</sup>

In Japan, the Intellectual Property High Court made a decision on the dispute between Apple and Samsung concerning FRAND royalties of Samsung's SEPs to the UMTS standard in May 2014. In the view of the Court, the calculation should be first based on the percentage of the contribution of the UMTS standard in the total sales price of the infringing products; and then the percentage of the contribution of the SEPs to the UMTS standard should be decided; and maximum royalty rates for all SEPs should be adopted.<sup>87</sup>

In China, the Shenzhen Intermediate Court made its decision on a FRAND royalty dispute between Huawei Technologies Co. Ltd. (Huawei) and InterDigital (IDC) on IDC's SEPs to 2G, 3G and 4G

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<sup>83</sup> The decision was considered as an 'evolution' instead of 'revolution' of the Georgia-Pacific factors, a routinely used set of factors by the US courts in the calculation of reasonable royalties. The factors include: (1) the royalties the patentee receives from existing licensing; (2) royalty rates the licensee pays for use of other comparable patents; (3) nature and scope of the licence; (4) the licensor's established policy and marketing program to maintain patent monopoly by not licensing others to use the invention; (5) commercial relationship between the licensor and the licensee; (6) effect of selling the patented specialty in promoting sales of other products of the licensee; and the existing value of the invention to the licensor as a generator of sales of its non-patented products; the extent of such derivative or conveyed sales; (7) duration of the patent and term of licence; (8) established profitability of the products made under the patent, its commercial success and its current popularity; (9) utility and advantages of patent property over old modes and devices; (10) the nature of the patented invention; the character of the commercial embodiment of it as owned and produced by the licensor; and the benefit to those who have used the invention; (11) the extent to which the infringer has made use of the patented invention and the value of such use; (12) the portion of profit or selling price customarily allowed for the use of the patented invention; (13) the portion of realizable profit which should be attributable to the invention as distinguished from non-patented elements, the manufacturing process, business risk or significant features or improvements added by the infringer; (14) opinion testimony of qualified experts; and (15) the royalties from a hypothetical negotiation at the time the infringement began. *Georgia-Pacific Corp. v United States Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y 1970), modified and aff'd, 446 F.2d 295 (2d Cir. 1971).

<sup>84</sup> *Microsoft Corp. v Motorola Inc.*, 2:10-cv-01823-JLR, 871 F. Supp. 2d 1089 (W.D. Wash. 2012). The decision was appealed to the US Court of Appeals for the Ninth Circuit, which affirmed the district court's decision on FRAND licensing and anti-suit injunction. *Microsoft Corp. v Motorola Inc.*, 696 F.3d 872 (9th Cir. 2012)

<sup>85</sup> *ibid.*

<sup>86</sup> Gregory Sidak, 'FRAND in India: The Delhi High Court's Emerging Jurisprudence on Royalties for Standard-Essential Patents' (2015) vol 10/no 8 Journal of Intellectual Law and Practice, 609. In its initial findings of Micromax's and Intex's complaints against Ericsson on its abuse of dominant positions, the CCI found that Ericsson's royalty calculation was based on the sales price of downstream products instead of the price of the smallest SEP incorporated components, which was considered as excessive and discriminatory. John Matheson, 'Patents and Standards: FRAND Challenges for India's ICT Sector' (17 September 2014) paper no 201401 SpicyIP Discussion Paper Series. Interestingly, in December 2016, the Supreme Court of the United States indicated that, in its ruling on Samsung's infringement of design patents owned by Apple Inc., that in the case of a multicomponent product, the 'article of manufacture' for calculating a damages award need not be the end product sold to consumers but may be only a component of that product. Nevertheless, the Supreme Court did not give clear guidance on how to define the scope of the 'article of manufacture' and what share of the Samsung's total profit would be attributable to the Apple's design patents. *Samsung Electronics Co., Ltd., et Al., Petitioners v Apple Inc.* 580 U.S. (2016).

<sup>87</sup> Takanori Abe (n 54).

standards.<sup>88</sup> In principle, the Court believed that royalties for SEPs should not exceed a certain percentage of the profit the implementer can obtain from his products; and the SEP holder should receive appropriate royalties for his contribution to the technology, and should in no way benefit from the demand for his products created by the adoption of the standard, which is over and above that created by the invention *per se*.<sup>89</sup> In its decision, the Shenzhen Intermediate Court took into account four factors in the calculation of royalties: the average profit margin for the industry; the quality and quantity of SEPs and R&D investment; the royalties collected by the patent holder from comparable licensing agreements; and the scope of the licensing market requested by the implementer.<sup>90</sup>

In addition to these national judicial decisions, in 2015, IEEE adopted a set of amendments to its patent policy, clarifying the meaning of "reasonable rate" for a SEP. First, the reasonable rate should not include the value resulting from the incorporation of the SEP within a standard; second, the reasonable rate should be determined by the value that the SEP contributes to the smallest saleable component of the standard-compliant product, taking into account the contributions made by all SEPs to the same standard; third, existing licences of the SEP can be taken into consideration, as long as they are obtained under sufficiently comparable circumstances and not under the explicit or implicit threat of injunctions.<sup>91</sup>

#### **4 THE RELEVANCE OF THE WTO TO THE DEBATE ON THE INTERPLAY BETWEEN PATENTS AND STANDARDS**

Patent holdup and holdout have a direct impact on the innovation and dissemination of patented technology, and the harmonization and implementation of international standards, which are promoted by the WTO TRIPS Agreement and the TBT Agreement respectively. The WTO Agreements resulting from the Uruguay Round of multinational trade negotiations set up a series of rules for international trade in goods, services and trade-related aspects of intellectual property. Based on its fundamental understanding that trade is crucial for country economic development and well-being, the WTO aims to establish a non-discriminatory international trading system, which helps trade flow as fairly and freely as possible among its Members.

Both the TBT Agreement and the TRIPS Agreement entered into force in January 1995, as part of the WTO Agreement, and are binding on all WTO Members. Both Agreements share WTO fundamental principles – national treatment and most-favoured-national (MFN) treatment.<sup>92</sup> The TRIPS Agreement aims to promote effective and adequate protection of IPRs, to reduce distortions and impediments to international trade, and to ensure that IPRs do not themselves become barriers to legitimate trade.<sup>93</sup> The TBT Agreement, while recognizing the right of WTO Members to implement technical regulations (mandatory standards) to achieve legitimate policy objectives, aims to ensure that these regulations are non-discriminatory and strongly encourages Members to base their technical regulations on international standards, in order to reduce unnecessary non-tariff obstacles to trade.<sup>94</sup> The discussion on patents and standards is closely related to the implementation of these two Agreements.

##### **4.1 The TRIPS Agreement**

The TRIPS Agreement establishes minimum substantive standards for the protection and enforcement of IPRs, with WTO Members being obliged to implement fully these standards in their

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<sup>88</sup> The decision was appealed to the Guangdong High Court and then further to the Supreme Court of the PRC. *Huawei v InterDigital Communications (IDC)*, Shenzhen Intermediate People's Court, Case No. (2011) 深中法知民初字第 857 号; Guangdong High People's Court (2013) 粤高法民三终字第 305 号;

<sup>89</sup> 叶若思 祝建军 陈文全, 标准必要专利使用费纠纷中 FRAND 规则的司法适用 (2013) China Academic Journal (Electronic Publishing House 2013); Jianjun Zhu, 'Rules of Judicial Discretion on Royalty Rates for Standard Essential Patents' (2014) vol 9 China IP News.

<sup>90</sup> *ibid.*

<sup>91</sup> IEEE-SA Standards Board Bylaws, Section 6 Patents, 6.1 Definitions, available at: <http://standards.ieee.org/develop/policies/bylaws/sect6-7.html>

<sup>92</sup> While the MFN treatment and national treatment can be found in three main WTO Agreements, that is, General Agreement on Tariffs and Trade (GATT), General Agreement on Trade in Services (GATS), and the TRIPS Agreement, these two principles are applied in different ways. The Agreement Establishing the World Trade Organization (WTO Agreement) Annex 1A, 1B and 1C.

<sup>93</sup> The TRIPS Agreement, Preamble.

<sup>94</sup> The TBT Agreement, Preamble and art 2.4.

national legislation after transitional periods.<sup>95</sup> While aiming at enhancing the level of IPR protection globally, the TRIPS Agreement stipulates that IP protection should contribute not only to the promotion of technological innovation but also to the transfer and dissemination of technology in a way that benefits both producers and users of technological knowledge; and that IP protection should strike a right balance of rights and obligations.<sup>96</sup> Therefore, the TRIPS Agreement provides for a number of flexibilities allowing Members to adopt appropriate measures in their national legislation and practices to promote their public interest in the sectors which are of vital importance to their socioeconomic development.<sup>97</sup>

The discussion on patent holdup and holdout, especially on compulsory licensing, anticompetitive abuse of IPRs, availability of injunctions, and determination of FRAND terms and conditions, presents a number of practical questions on the nature, scope and range of these flexibilities provided within the TRIPS Agreement.

#### 4.1.1 Compulsory licensing

In the area of patent protection, one of the most important flexibilities in the TRIPS Agreement is non-voluntary licensing provided for in Article 31. The existence of Article 31 reflects TRIPS negotiators' recognition of the need to adjust the patent rights granted in Article 28.

Article 31 is entitled "other use without authorization of the right holder", which is understood to include non-voluntary licensing (also referred to as compulsory licensing) or use by or for the government without the authorization of the patent holder (referred to as government use).<sup>98</sup> This Article is one of the most intensively negotiated TRIPS provisions<sup>99</sup> and one of the most sensitive TRIPS provisions in the context of TRIPS implementation.<sup>100</sup>

Article 31 first recognizes that WTO Members have the right to authorize non-voluntary licences subject to certain conditions. While Article 31 identifies several grounds upon which a non-voluntary licence can be granted, such as anticompetitive practices and dependent patents, Article 31 does not lay down any restrictions on WTO Members' right to provide other grounds in their national laws. In other words, governmental authorities have freedom to determine the grounds

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<sup>95</sup> The TRIPS Agreement *per se* and subsequent TRIPS Council's decisions agreed to give WTO Members various transitional periods to fully implement the TRIPS Agreement, depending on their level of economic development. The TRIPS Agreement entered into force on 1 January 1995. For example, all Members were obliged to comply with Articles 3, 4, and 5 of the TRIPS Agreement by 1 January 1996. Under Article 65, developed Members had a one-year transitional period and therefore had no obligation to comply with the TRIPS Agreement until 1 January 1996. Developing Members and Members transitioning from a centrally planned economy to a market economy had an additional four-year transitional period to meet their obligations under the TRIPS Agreement except for Articles 3, 4, and 5. In other words, they had to fully implement the TRIPS Agreement by 1 January 2000. Article 65 gave an additional five-year transition period for developing countries to meet their obligation of patent protection for pharmaceutical and agricultural chemical products, namely no obligation to provide patent protection for pharmaceutical and agricultural chemical products until 1 January 2005. Article 66 and subsequent decisions specify transitional arrangements for least-developed-country (LDC) Members. See WTO 'Extension of the Transition Period under Article 66.1 for Least-Developed Country Members; Decision of the Council For TRIPS of 29 November 2005' (30 November 2005) IP/C/40; WTO 'Extension of the Transition Period under Article 66.1 for Least Developed Country Members: Decision of the Council For TRIPS of 11 June 2013' (12 June 2013) IP/C/64.

<sup>96</sup> The TRIPS Agreement, art 7.

<sup>97</sup> The TRIPS Agreement, art 8.

<sup>98</sup> Jayashree Watal, *Intellectual Property Rights in the WTO and Developing Countries* (Oxford University Press 2001) 317-318; Daniel Gervais, *The TRIPS Agreement – Drafting History and Analysis* (4th edn, Sweet & Maxwell 2012) 492.

<sup>99</sup> Watal (n 98) 317; Jayashree Watal and Antony Taubman (eds) *The Making of the TRIPS Agreement – Personal Insights from the Uruguay Round Negotiations* (World Trade Organization 2015) 111-113, 142-143, 161-162, 222-225, 267-268, 303-308.

<sup>100</sup> Since the TRIPS Agreement entered into force in 1995, developing countries and LDCs expressed their great concerns over the impact of strengthened IP protection under the TRIPS Agreement of affordable access to medicines, especially because of differing views and interpretations of the nature and scope of TRIPS flexibilities, such as Article 31, and pressure from their trading partners not to use existing flexibilities. In response to these concerns, at its Fourth Ministerial Conference in Doha in 2001, WTO Members made a Declaration on the TRIPS Agreement and Public Health, in which Ministers stressed that it was important to implement and interpret the TRIPS Agreement in a way that supports WTO Members' right to protect public health and to promote access to medicines for all, and reaffirms governments' right to use the TRIPS Agreement's flexibilities, including the grant of compulsory licences under Article 31 for this purpose. WTO 'Declaration on the TRIPS Agreement and Public Health' (20 November 2001) WT/MIN(01)/DEC/2.

upon which non-voluntary licences can be granted. This understanding is explicitly affirmed in the Doha Declaration on the TRIPS Agreement and Public Health.<sup>101</sup> In some national legislation, the substantive grounds in addition to those identified in the TRIPS Agreement include non-working or insufficient working of patents<sup>102</sup> and failure to obtain voluntary licences.<sup>103</sup>

While Article 31 does not restrict governments from granting non-voluntary licenses, it provides nine conditions, as strict safeguards, to protect the legitimate interests of patent holders.<sup>104</sup> The interpretations of these conditions, especially the conditions contained in Articles 31(b) and (f), have provoked discussion on whether non-voluntary licensing provides a desirable solution to the issue of patent holdup.

First, under Article 31(b), a non-voluntary licence can only be authorized when a potential licensee has made an attempt to obtain a voluntary licence on reasonable commercial terms and conditions, and such attempt has been unsuccessful within a reasonable period of time prior to applying a compulsory licence. This condition need not to be applied in three circumstances: (1) in the case of a national emergency or other circumstances of extreme urgency; (2) in cases of public non-commercial use; or (3) when a compulsory licence is granted as a remedy in an adjudicated case of anticompetitive practices.<sup>105</sup>

In the debate on patent holdup, one question raised is whether an unsuccessful attempt to obtain a voluntary licence on reasonable commercial terms and conditions within a reasonable period of time (referred to as refusal to license) *per se* can be a substantive ground for granting a compulsory licence or refusal to license is only a procedural requirement for the grant of compulsory licences.<sup>106</sup> Some argue that refusal to license *per se* constitutes a substantive ground

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<sup>101</sup> See WT/MIN(01)/DEC/2, para 5(b). This affirmation makes it clear that 'national emergencies or other circumstances of extreme urgency' referred to in Article 31(b) of the TRIPS Agreement are not an essential pre-condition for the grant of compulsory licences, and that it is only to indicate that, in these circumstances, the condition that efforts must be first made to seek a voluntary licence does not apply.

<sup>102</sup> In 2001, the United States raised a WTO dispute against Brazil concerning Brazil's 1996 Industry Property Law which has provisions on the ground of non-working for compulsory licences. According to Article 68 of the Industrial Property Law, a patent shall be subject to compulsory licensing if the subject matter of the patent is not 'worked' in the territory of Brazil, and specifically a compulsory licence shall be granted on a patent if the patented product is not manufactured in Brazil or if the patented process is not used in Brazil. In addition, if a patent owner chooses to exploit the patent through importation rather than 'local working', then Article 68 will allow others to import either the patented product or the product obtained from the patented process. The United States raised the issue before the WTO panel, asserting that Article 68 discriminated against US owners of Brazilian patents, whose products were imported into, but not locally produced in, Brazil, and Article 68 also curtailed the exclusive rights conferred on these owners by their patents. As such, Brazil's local working requirement appeared inconsistent with its obligations under TRIPS Article 27.1, which requires patents are available without discrimination as to whether products are imported or locally produced, and TRIPS Article 28.1 which confers exclusive patent rights. In the view of Brazil, Article 68 was fully compatible with the TRIPS Agreement. The dispute was finally settled by a mutually agreed solution, which mainly indicated that the Brazilian Government agrees, in the event it deems necessary to apply Article 68 to grant compulsory licences on patents held by the US companies, to hold prior talks on the matter with the US Government. WTO 'Brazil – Measures Affecting Patent Protection: Notification of Mutually Agreed Solution' (19 July 2001) WT/DS199/4; WTO 'Brazil – Measures Affecting Patent Protection: Request for the Establishment of a Panel by the United States' (9 January 2001) WT/DS199/3.

<sup>103</sup> WIPO, 'Exclusions from Patentable Subject Matter and Exceptions and Limitations to the Rights' (4 February 2009) SCP/13/3, paras 138-184.

<sup>104</sup> The nine conditions identified in Article 31 include: (1) authorization of non-voluntary uses should be considered on their individual merits; (2) as a general rule, the applicant for a non-voluntary use must have made an unsuccessful attempt to obtain a voluntary licence on reasonable commercial terms and conditions within a reasonable period of time before applying a compulsory licence; (3) scope and duration of the non-voluntary licence are to be limited to the purposes for which the licence is granted; (4) and (5) the nature of the non-voluntary licences should be non-exclusive and non-assignable; (6) the products produced under the non-voluntary licence should be predominantly for the supply of the domestic market; (7) the authorization shall be liable to be terminated if and when the circumstances which led to it cease to exist and are unlikely to recur; (8) the patent holder still has the right to be paid adequate remuneration; and (9) any decisions relating to the legal validity of grant of the non-voluntary licence and the remuneration should be subject to judicial or other independent review.

<sup>105</sup> The TRIPS Agreement, arts 31(b) and (k). The Doha Declaration on the TRIPS Agreement and Public Health clarified that Members have the right to determine what constitutes a national emergency or other circumstances of extreme urgency, it being understood that public health crises, including those relating to HIV/AIDS, tuberculosis, malaria and other epidemics, can represent a national emergency or other circumstances of extreme urgency.

<sup>106</sup> EC Report on CD-Rs (n 82) 28-38.

for the grant of compulsory licences, permitted by Article 31(b) and reflected in many countries' legislation.<sup>107</sup> Others argue that refusal to license is part of the exclusive patent rights granted by TRIPS Article 28, and therefore refusal to license is only a procedural requirement for the grant of compulsory licences, but not a substantive ground.<sup>108</sup> In other words, substantive grounds must exist in addition to refusal of licence in order to grant compulsory licences.<sup>109</sup>

Besides, even if there is a common understanding that unjustified refusal to license *per se* can be a ground for the grant of compulsory licences, another issue is what is "reasonable commercial terms and conditions" referred to in Article 31(b). The terms of "reasonable" and "commercial" are used in several articles of the TRIPS Agreement. While their meanings are touched upon in the TRIPS Agreement and WTO TRIPS-related dispute settlement<sup>110</sup>, Article 31(b) *per se* does not convey any meanings of "reasonable commercial terms and conditions".

Another question raised is related to Article 31(f), which provides that non-voluntary licensing must be used predominantly to supply the domestic market of the Member authorizing such licence.<sup>111</sup> This Article intends to limit the economic benefit accruing to compulsory licensees. If the size of the domestic market is not big enough or if major markets are outside the country, the licensee will not have the economic incentive to use the non-voluntary licence. It is not disputed that Article 31(f) allows some legal exports of the products produced under compulsory licences. But what obligations WTO Members have before and after their authorization of compulsory licence is a contentious issue.<sup>112</sup> Specifically it was debated whether, under Article 31(f), WTO Members have the obligation to examine the export history of potential compulsory licensees before the authorization and to take measures in effectively monitoring the use of the compulsory licence after the authorization, especially when it is aware of the licensee's export history.<sup>113</sup>

#### 4.1.2 Control of anticompetitive practices

The TRIPS Agreement is the very first international IP agreement to incorporate elements of competition policy.<sup>114</sup> Article 40 recognizes that some licensing practices or conditions relating to IPRs can be anticompetitive, and then have adverse effects on trade and impede the transfer and dissemination of technology.<sup>115</sup> In the light of Article 8.2 of the TRIPS Agreement, Members are allowed to take any appropriate measures to prevent the abuse of IPRs, provided that such measures are consistent with the provisions of the TRIPS Agreement. Article 40 indicates that Members have the freedom to specify anticompetitive licensing practices or conditions in their national legislation that may in particular cases constitute an abuse of IPRs.<sup>116</sup> The TRIPS Agreement does not explicitly indicate what licensing practices or conditions *per se* must be treated as anticompetitive or what rules/standards Members are obliged to use to review licensing practices or conditions. Nevertheless, the TRIPS Agreement gives an illustrative and non-exhaustive list of anticompetitive licensing practices or conditions, including exclusive grant-back conditions, conditions preventing challenges to validity of patents, and coercive package

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<sup>107</sup> Watal (n 98) 318-320, 323.

<sup>108</sup> EC Report on CD-Rs (n 82). The Report indicated that substantive grounds were indirectly referred to in Article 31 of the TRIPS Agreement, including national emergency, other circumstances of extreme urgency, public non-commercial use, to remedy a practice determined to be anticompetitive, and exploitation of a second patent.

<sup>109</sup> *ibid.*

<sup>110</sup> WTO, 'China — Measures Affecting the Protection and Enforcement of Intellectual Property Rights, Report of the Panel' (26 January 2009) WT/DS362/R. Under Article 61 of the TRIPS Agreement, Members shall provide for criminal procedures and penalties for trademark counterfeiting or copyright piracy on a commercial scale. In its report, the Panel found that the term 'commercial scale' in TRIPS Article 61 meant 'the magnitude or extent of typical or usual commercial activity with respect to a given product in a given market'.

<sup>111</sup> Article 31(f) is waived under the It allows pharmaceutical products produced under compulsory licences to be exported to countries that lack production capacity, provided certain conditions and procedures are followed.

<sup>112</sup> Huai-Chi Cheng and Kuei-Jung Ni, 'The Boundary of a WTO Member's Obligation to Comply with Art. 31(f) of the TRIPS Agreement – A Critical Review of Granting a Compulsory License on Philips CD-R Patents by Taiwan' (8/2012) vol 43 IIC 885.

<sup>113</sup> *ibid.*

<sup>114</sup> This has been considered as 'a significant achievement' of the Uruguay Round. Watal (n 98) 304.

<sup>115</sup> The TRIPS Agreement, art 40.

<sup>116</sup> The TRIPS Agreement, art 40.2. It is still arguable whether Members have the freedom to specify a list of licensing practices or conditions, which are considered illegal *per se*. Watal (n 98) 308.

licensing.<sup>117</sup> It is understood that WTO Members have the freedom to prevent other anticompetitive practices or conditions which are not mentioned in the list in their national laws.<sup>118</sup>

This provision leads to significant variations of national legislation and practices on what practices or conditions will be considered as anticompetitive, especially in what circumstances refusal to license should be condemned as an anticompetitive practice if refusal to license *per se* is not absolutely prohibited according to national law. These questions become more complicated when the subject matter of the licence is a SEP subject to FRAND commitments.

In addition, the TRIPS Agreement explicitly indicates that Members can use compulsory licences to remedy anticompetitive practices, and are not obliged to apply certain conditions that must be respected in other grants of compulsory licences, notably the conditions provided for in Article 31(b) and 31(f). In other words, there is no longer a requirement for a potential compulsory licensee to seek first a voluntary licence, and the goods produced under a compulsory licence need not be predominantly for the supply of the domestic market of the country granting the compulsory licence. The waiver of these two conditions makes compulsory licences more accessible and profitable for the potential licensee. However, it is unclear whether the increased accessibility and profitability of compulsory licences would be appropriate in addressing the abuse of SEPs, in particular if a SEP holder seeking an injunction for the SEP infringement may be considered as abusing his patent rights (see section 3.6).

#### 4.1.3 Injunctions

Part III of the TRIPS Agreement specifies detailed enforcement provisions to enable IP holders to enforce their IPRs effectively. Accordingly, WTO Members are, *inter alia*, obliged to follow certain procedures with respect to injunctions as provided for in Article 44.

Article 44 obliges Members to authorize courts or other judicial authorities to order injunctions to enable IPR holders to cease infringement, especially in preventing the distribution in the domestic market of imported infringing goods immediately after their customs clearance.<sup>119</sup> However, there are three exceptional circumstances in relation to this obligation. First, Members are not obliged to make injunctions applicable to products acquired or ordered in good faith, such as innocent infringement of a chip incorporating an infringing layout-design or a product incorporating such a chip.<sup>120</sup> Second, in cases of government use or compulsory licences, the remedies can be limited to payment of remuneration.<sup>121</sup> Third, where TRIPS remedies are inconsistent with a Member's domestic laws, declaratory judgements and adequate compensation shall be available.<sup>122</sup> Thus, while the TRIPS Agreement obliges Members to authorize national authorities to issue injunctions for IPR infringement in general, the availability of injunctions can be limited in certain circumstances. Current national practices on the limited availability of injunctions for SEP infringement (see section 3.3) seem to be consistent with these TRIPS provisions.

#### 4.1.4 Calculation of FRAND royalties

As discussed above, the fundamental issue of patent holdup and holdout is what are FRAND terms and conditions, and specifically what FRAND royalties are. Appropriate valuation of patented technology and calculation of royalties are crucial for reaching agreement between patent holders and users in voluntary licensing negotiations; assessment of "reasonable commercial terms and conditions" and "adequate remuneration" in governments' authorization of compulsory licences; and last but not least calculation of damages in patent infringement litigations. The TRIPS Agreement does not give direct guidance on what are FRAND royalties, but several provisions, in addition to Article 31(b), are pertinent to this question, including TRIPS Articles 31(h), 31(k), 37, and 45.

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<sup>117</sup> The TRIPS Agreement, art 40.2.

<sup>118</sup> Watal (n 98) 308.

<sup>119</sup> It should be noted that Article 50 of the TRIPS Agreement obliges Members to authorize their judicial authorities to order provisional measures as temporary or interim injunction in order to prevent an IPR infringement from occurring, in particular to prevent goods from entering the distribution channel, including imported goods immediately after customs clearance; or to preserve relevant evidence concerning an alleged infringement. The TRIPS Agreement, art 50.

<sup>120</sup> The TRIPS Agreement, art 44.1.

<sup>121</sup> The TRIPS Agreement, art 44.2.

<sup>122</sup> The TRIPS Agreement, art 44.2.

Article 31(h) provides that, under a compulsory licence, a patent holder shall be paid "adequate remuneration", taking into account the "economic value of the authorization" in each case.<sup>123</sup> Article 31(k) indicates that in cases of compulsory licences issued to remedy an anticompetitive practice, the "need to correct anticompetitive practices" should be taken into account in determining the amount of the remuneration.<sup>124</sup> Article 45 provides that judicial authorities should order the IP infringer who infringed IPRs in bad faith to pay the IPR holder damages, which should be "adequate" to compensate for the injury suffered by the holder.<sup>125</sup> In certain cases, the judicial authorities may order recovery of profit and/or payment of pre-established damages either where the infringer did not know or had reasonable grounds to know the infringement.<sup>126</sup> For the innocent infringement of layout-designs of chips, Article 37 provides that given that it shall not be considered unlawful, and that the innocent infringer must be allowed to continue distributing his existing or pre-ordered stock of such chips or products, the innocent infringer should pay the right holder "reasonable royalty", which is payable under "a freely negotiated licence".<sup>127</sup>

Clearly the TRIPS Agreement refers to different methods of calculating royalties in different contexts. The interpretations of these methods and their relationship vary significantly.

Some view that the "reasonable commercial terms and conditions" referred to in Article 31(b) must be determined by the market<sup>128</sup>, the nature of the patented technology, considering the practices in the country granting the compulsory licence, its neighbouring countries' or global standards.<sup>129</sup> In others' view, competent governmental authorities should take into account the duration of the patent, market prospect of the patent, social and public benefits, and the ability of licensees and consumers to pay<sup>130</sup>, and that there is no need to consider global standards or neighbouring countries' standards.<sup>131</sup>

Regarding the "adequate remuneration" under Article 31(h), some indicate that it should be based on the scope and purpose of the authorization of the licence, which may distinguish the economic value of the authorization from the full market value of the patent.<sup>132</sup> Others assert that it means "normal cost" of a licence available from the patent holder, depending on the degree of inventiveness and the size of the market.<sup>133</sup> If the technology is not available in a market concerned, it then should take into account economic and other circumstances of the country concerned, practices in relevant neighbouring countries and worldwide markets and profit generated for the licensee.<sup>134</sup> However, others argue that "adequate remuneration" under Article 31(h) does not require the licensee to compensate the patent holder fully or pay his "normal cost" or to pay an equitable remuneration corresponding to the economic value of the licence<sup>135</sup>, and that "adequate remuneration", under Article 31(h), should be based on the potential profit of the licensee and the economic value of the authorization to him so as to ensure that the licensee cannot collect high profits, such as asking for high prices for his product but pay low remuneration to the patent holder.<sup>136</sup> It is also logical that "adequate remuneration" under Article 31(h) cannot be higher than the "reasonable terms and conditions" under Article 31(b).<sup>137</sup> Regarding the "need to correct anticompetitive practices" under Article 31(k), it is considered that the remuneration

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<sup>123</sup> The TRIPS Agreement, art 31(h).

<sup>124</sup> The TRIPS Agreement, art 31(k).

<sup>125</sup> The TRIPS Agreement, art 45.

<sup>126</sup> The TRIPS Agreement, art 45.2.

<sup>127</sup> Innocent infringement of layout-designs of integrated circuits is defined as a person not having known and having no reasonable ground to know to import, sell or otherwise commercially distribute a chip incorporating an unlawfully reproduced layout-design or a product incorporating such a chip at the time of acquiring the integrated circuit or product. The TRIPS Agreement, art 37.

<sup>128</sup> EC Report on CD-Rs (n 82).

<sup>129</sup> Gervais (n 98) 494; EC Report on CD-Rs (n 82).

<sup>130</sup> EC Report on CD-Rs (n 82)39; Watal (n 98) 323.

<sup>131</sup> Watal (n 98) 323.

<sup>132</sup> Antony Taubman, 'Rethinking TRIPS: "Adequate Remuneration" for Non-Voluntary Patent Licensing' (2008) vol 11/no 4 Journal of International Economic Law 927, 954-955.

<sup>133</sup> Gervais (n 98) 496.

<sup>134</sup> *ibid.*

<sup>135</sup> Watal (n 98) 325-326. It is argued that 'if this were the case, the licence would be termed as "voluntary"'.  
<sup>136</sup> Watal (n 98) 326.

<sup>137</sup> EC Report on DC-Rs (n 82) 43-44.

under Article 31(k) can be lower than "adequate remuneration" under Article 31(h)<sup>138</sup> and even be zero.<sup>139</sup>

Regarding the damages for deliberate IP infringement, some view that punitive damages are not necessarily imposed in infringement cases.<sup>140</sup> Others contend that the imposition of punitive damages should be considered consistent with the TRIPS Agreement, especially Article 45.2, which requires that the enforcement should be effective and deterrent to the infringement.<sup>141</sup> In the event of innocent infringement, the calculation of damages can take into account the profit margins of the innocent infringer.<sup>142</sup>

It is understandable that the interpretation of the aforementioned provisions should be left to national authorities as part of the flexibilities provided for WTO Members. However, it is important for Members to strive as far as possible for a certain coherence and consistency among their interpretations. Such coherence and consistency will provide both patent holders and users with legal certainty and enable them to have legitimate and reasonable expectations during their negotiations of FRAND royalties, therefore effectively deterring patent holdup and holdout.<sup>143</sup>

## 4.2 The TBT Agreement

The WTO is not a standard setting organization, but it promotes the adoption and harmonization of international standards in order to reduce unnecessary non-tariff barriers to trade. The TBT Agreement recognizes Members' right to use technical regulations to achieve legitimate objectives, such as national security requirements, protection of human health and safety or the environment, but requires that the preparation, adoption and application of technical regulations should not create unnecessary obstacles to international trade.<sup>144</sup> The TBT Agreement sets up a series of principles for the preparation, adoption and application of technological regulations, encouraging Members to use existing international standards as a basis for their national technical regulations.<sup>145</sup> Meanwhile, the TBT Agreement allows WTO Members to depart from an existing international standard, if such an international standard would constitute an ineffective or inappropriate means for the fulfilment of legitimate objectives.<sup>146</sup>

While WTO Members developed six principles for the establishment of international standards, namely, transparency, openness, impartiality and consensus, effectiveness and relevance, coherence, and development dimension, the TBT Agreement does not provide a clear definition of international standards.<sup>147</sup> One of the key issues for the implementation of the TBT Agreement is what constitutes an international standard or which standardizing bodies should be acknowledged by the WTO as international SSOs. Some Members have argued that certain international SSOs,

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<sup>138</sup> Gervais (n 98) 496.

<sup>139</sup> Watal (n 98) 326. In February 2007, the US FTC issued its remedial opinion and final order in Rambus Inc. case, in which Rambus failed to disclose its patent and pending patent application relating to Dynamic Random Access Memory (DRAM), a standard developed by the Joint Electron Device Engineering Council (JEDEC). Based on its finding of Rambus's violation of the JEDEC's disclosure policy and Section 2 of the Sherman Act and Section 5 of the FTC Act, the FTC issued a worldwide and nonexclusive compulsory licence for Rambus's standard-related patents and also decided the maximum royalty rate (0.5% for SDRAM and 0.25% for SDRAM) and that Rambus should be remunerated for three years after the FTC's order. After three years, the royalty rates should drop to zero. The FTC order was then appealed to the US Court of Appeals for the District of Columbia Circuit (CADDC), and in April 2008, the Court set aside the Commission's orders. In November 2008, the FTC filed a Petition for Writ of Certiorari with the Supreme Court seeking review of the CADDC's decision. The Petition was denied by the Supreme Court, and on May 14, 2009 the Commission formally dismissed the complaint. Rambus Inc. Case Summary, available at: <https://www.ftc.gov/enforcement/cases-proceedings/011-0017/rambus-inc-matter>

<sup>140</sup> Watal (n 98) 347.

<sup>141</sup> Gervais (n 98) 582.

<sup>142</sup> Watal (n 98) 289.

<sup>143</sup> Antony Taubman pointed that 'the adequacy of remuneration is a very narrow legal issue. But like a pinhole camera, it offers a much broader picture: it exemplifies how to situate TRIPS within the international trade regime, within the law of investment, and public international law, and illuminates how to interpret and apply TRIPS as law in settling bilateral disputes.' Taubman (n 132) 935.

<sup>144</sup> The TBT Agreement, art 2.2.

<sup>145</sup> The TBT Agreement, art 2.4.

<sup>146</sup> The TBT Agreement, art 2.4.

<sup>147</sup> WTO, 'Decision of the TBT Committee on Principles for the Development of International Standards, Guides and Recommendations with Relation to Articles 2, 5 and Annex 3 of the TBT Agreement' (13 November 2000) G/TBT/9, paras 17-25 and Annex 4.

including ISO, IEC and ITU should be designated by the WTO as international standard organizations, as referred to in the TBT Agreement, while other Members have said that as long as the standard setting process is consistent with the TBT principles, the standard should be acknowledged as an international standard referred to in the TBT Agreement.<sup>148</sup>

The issue of patent holdup and holdout may complicate the discussion in at least two ways: (1) whether SSOs' patent policy, especially the requirements of disclosure and FRAND commitments, should be reflected in the six principles of the TBT Agreement for the establishment of international standards, or be considered as an important principle for international standard development in the ICT sector; and (2) whether patent holdup can be considered as a valid reason allowing WTO Members to depart from existing international standards.

In theory, WTO Member countries are encouraged to adopt international standards as national standards, as this will help domestic companies avoid technical barriers to their exports and expand international markets. However, when patent holdup occurs, Member countries are forced to develop their own national standards instead of using existing international standards, as the national standard can promote indigenous innovation capabilities, help domestic industries reduce technological dependence on foreign companies, avoid unreasonable royalties, and ensure national security.<sup>149</sup> However, these national standards can constitute barriers for foreign companies to enter the market.<sup>150</sup> There are several examples in practice, such as TD-SCDMA as a substitute for W-CDMA and CDMA-2000 in the mobile telephony industry, WAPI as a substitute for SSID, MAC and WEP in wireless local area networks (LANs), and EVD as a substitute for DVD in the field of video discs.<sup>151</sup>

### 4.3 Members' discussion on patents and standards in the WTO

#### 4.3.1 The WTO TBT Committee

In 2005, China raised the issue of the relationship between standards and IPRs in the WTO TBT Committee. In its initial proposal, China indicated that the TBT Agreement recognizes the role of international standards in promoting international trade and facilitating the dissemination of technology, and that it obliges WTO Members to implement existing international standards as a basis for their national technical regulations, as long as those standards are effective or appropriate to fulfil Members' legitimate objectives.<sup>152</sup> However, when IPRs are incorporated into international standards, it would be difficult for Members to access and implement these international standards, and this could have an adverse impact on the preparation, adoption and application of international standards.<sup>153</sup> It therefore called on WTO Members to develop appropriate international policies to address the tension between IPRs and standards in the context of the triennial review of the TBT Committee.<sup>154</sup> In its follow-up proposal, China further specified that, if there was no clear rule on standard-related IPRs, it would be difficult for WTO Members to adopt international standards, especially as the basis of their national technical

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<sup>148</sup> WTO, 'Market Access for Non-Agricultural Products - Negotiating Text - Understanding on the Interpretation of the Agreement on Technical Barriers to Trade as Applied to Trade in Electronics - Communication from the European Union' (23 June 2010) TN/MA/W/129/Rev.1, para 3.1; WTO, 'Market Access for Non-Agricultural Products - International Standards - Communication from the United States' (28 June 2010) TN/MA/W/138.

<sup>149</sup> Dieter Ernst, *Indigenous Innovation and Globalization: The Challenge for China's Standardization Strategy* (the UC Institute on Global Conflict and Cooperation and the East-West Centre, 2011), available at: <http://www.eastwestcenter.org/sites/default/files/private/ernstindigenousinnovation.pdf>.

<sup>150</sup> Zia K Cromer, 'China's WAPI Policy: Security Measure or Trade Protectionism' (2005) No.18 Duke Law & Technology Review 1.

<sup>151</sup> Ernst (n 149) ch 5; Cromer (n 150).

<sup>152</sup> WTO, 'Intellectual Property Right (IPR) Issues in Standardization - Communication from the People's Republic of China' (25 May 2005) G/TBT/W/251; WTO, 'Minutes of the Meeting of Committee on Technical Barriers to Trade of 16-17 June 2005' (4 August 2005) G/TBT/M/36, paras 100-101.

<sup>153</sup> *ibid.*

<sup>154</sup> *ibid.* Under Article 15.4 of the TBT Agreement, the TBT Committee is required to review the operation and implementation of the TBT Agreement once every three years. The review aims to make recommendations on the adjustment of the rights and obligations provided for under the TBT Agreement to ensure mutual economic advantage and a balance of rights and obligations. The TBT Agreement, art 15.1. WTO, 'Minutes of the Meeting of Committee on Technical Barriers to Trade of 7-9 July 2006' (31 July 2006) G/TBT/M/39 paras 118-127; WTO, 'Fourth Triennial Review of the Operation and Implementation of the Agreement on Technical Barriers to Trade under Article 15.4' (14 November 2006) G/TBT/19, 19.

regulations.<sup>155</sup> Therefore China suggested that WTO Members and international standard setting bodies should provide the TBT Committee with information on their IPR policies in order to facilitate WTO Members' discussion.<sup>156</sup>

During the discussion, some Members questioned the relevance of IPRs to the TBT Committee's work and sought clarification as to China's motivation in the TBT Committee.<sup>157</sup> China believed that this issue was germane to the TBT Committee's work and should be addressed in the triennial review of the TBT Committee<sup>158</sup>, clarifying that the objective of its proposal was to exchange information among WTO Members concerning their national practices and experiences.<sup>159</sup> Other Members recognized the importance of this issue, but were unsure whether the TBT Committee was the most appropriate forum for discussion of this issue.<sup>160</sup> China indicated its willingness to discuss this issue in other WTO bodies, such as the TRIPS Council.<sup>161</sup>

In 2007, China proposed a draft TBT Committee Decision on the Guideline for IPR Issues Concerning the Preparation, Adoption and Application of Standards, but WTO Members failed to undertake an in-depth discussion on the draft in the TBT Committee.<sup>162</sup>

In 2010, the European Union submitted a negotiating text on market access for non-agricultural products in the WTO Negotiating Group on Market Access. In this text, the European Union proposed that if technical specifications for innovative electronic products developed by interested parties or industry consortia were considered as international standards, they should not restrict the use of these technical specifications through licences or other entitlements and should disclose all technical information necessary to implement the standard.<sup>163</sup>

In recent years, the issue of patents and standards has been raised often within the WTO trade policy review (TPR) process. The TPR is conducted by the WTO TPR Body, which comprises the WTO's full membership, to review WTO Members' trade policies and practices with the aims of enhancing the transparency of their trade policies and facilitating the smooth functioning of the multilateral trading system. During the review process, a wide range of information related to patents and standards had been provided by main traders, including the United States, China, the European Union and Japan.<sup>164</sup>

#### 4.3.2 The WTO Council for TRIPS

The discussion on the issue of patents and standards presents a number of practical questions on the implementation of the TRIPS Agreement, in particular its provisions on compulsory licensing, anticompetitive abuse of IPRs, injunctions, and valuation of patented technology (see section 4.1). However, this issue has not been raised in the WTO TRIPS Council until now.

Nevertheless, this issue was raised in the Standing Committee on the Law of Patents (SCP) in the World Intellectual Property Organization (WIPO) in June 2008.<sup>165</sup> Upon its members' request, the

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<sup>155</sup> WTO, 'Intellectual Property Right (IPR) Issues in Standardization - Background Paper for Chinese Submission to WTO on Intellectual Property Rights Issues in Standardization (G/TBT/W/251) - Communication from the People's Republic of China' (9 November 2006) G/TBT/W/251/Rev.1, paras 18-20; WTO, 'Minutes of the Meeting of Committee on Technical Barriers to Trade of 15 and 17 March 2006' (23 May 2006) G/TBT/M/38, paras 140-146.

<sup>156</sup> WTO G/TBT/W/251/Rev.1 (n 155) para 21; WTO G/TBT/M/38 (n 155) para 146.

<sup>157</sup> WTO, 'Minutes of the Meeting of 2 November 2005' (22 December 2005) G/TBT/M/37, paras 111, 120-121; WTO G/TBT/M/36 (n 152) para 103; WTO G/TBT/M/38 (n 155) paras 148-149.

<sup>158</sup> WTO G/TBT/M/37 (n 157) paras 115-118.

<sup>159</sup> WTO G/TBT/M/38 (n 155) para 150.

<sup>160</sup> WTO G/TBT/M/37 (n 157) para 120.

<sup>161</sup> WTO G/TBT/M/37 (n 157) para 118.

<sup>162</sup> WTO, 'Minutes of the Meeting of Committee on Technical Barriers to Trade of 5 July 2007' (6 August 2007) G/TBT/M/42, para 176. China's draft was circulated to WTO Members as a room document.

<sup>163</sup> WTO TN/MA/W/129/Rev.1 (n 148) paras 3.3.1, 3.3.2, and 3.3.2(d).

<sup>164</sup> WTO, 'Trade Policy Review - European Union - Minutes of the Meeting' (14 October 2015) WT/TPR/M/317/Add.1, 173-174, 300-301; WTO, 'Trade Policy Review - the United States of America - Minutes of the Meeting' (16 February 2015) WT/TPR/M/307/Add.1, 159-160; WTO, 'Trade Policy Review - China - Minutes of the Meeting' (9 September 2014) WT/TPR/M/300/Add.1, 213-215; WTO, 'Trade Policy Review - Report by the Secretariat - Japan - Revision' (18 June 2013) WT/TPR/S/276/Rev.1, paras 118-125.

<sup>165</sup> WIPO, 'Report on the 12th Session of SCP' (23 March 2009) SCP/12/5.

SCP prepared a preliminary study on patents and standards.<sup>166</sup> The study provoked broad discussion among WIPO members. In particular, Brazil mentioned that this issue had already been addressed in the WTO TBT Committee, and therefore the discussion on this issue at WIPO should be pursued in a manner consistent with WTO provisions on the subject.<sup>167</sup> Brazil also indicated that the WTO was also an adequate forum for this issue.<sup>168</sup>

The TRIPS Council, as one of the three sectoral councils operating under the WTO General Council, is responsible for the administration of the TRIPS Agreement. While monitoring the operation of the TRIPS Agreement, the Council constitutes a forum for WTO Members to consult or negotiate issues relating to the implementation of the TRIPS Agreement. In particular, Article 71.1 of the TRIPS Agreement requires the Council to review the implementation of the TRIPS Agreement every two years in the light of any relevant new developments.<sup>169</sup> This review is one of the built-in agenda items at the TRIPS Council's meetings under which Members can share their experience and discuss any new issues relevant to the implementation of the TRIPS Agreement.

## 5 CONCLUSION

While sharing certain common objectives, patent protection and standardization have their different policy goals. This leads to the tension between patent holders and standard implementers, as evidenced by a large number of SEP-related disputes in the ICT sector. Given the limitations of existing policy measures, it is foreseeable that the issue of patent holdup and holdout will continue to be central to the debate among divergent stakeholders in the near future.

In this debate, there is a high demand for transparency and certainty of national rules and substantive coordination of these rules at the international level in order to avoid trade disputes among trading partners. This is because that the ICT sector is considered as a highly globalized industry, in which companies often locate their R&D activities, manufacturing and marketing in different countries in order to achieve worldwide competitiveness.<sup>170</sup>

As expected, ICT-related standard and patent issues have been raised frequently in bilateral and multilateral trade dialogues. For example, since 2015, the issue of patents and standards has been one of the agenda items discussed by the US-China Joint Commission on Commerce and Trade.<sup>171</sup> As the top two exporting and importing countries of ICT products, China and the United States recognized the importance of standard setting in promoting innovation, competition and consumer welfare, and reaffirmed that IPR protection and enforcement was critical to promote innovation.<sup>172</sup> In March 2016, the WTO TBT Committee discussed 57 specific trade concerns, a significant number of which were related to standards and regulations in the ICT sector.<sup>173</sup>

The issue of patents and standards directly impacts the innovation and dissemination of patented technology, and the harmonization and implementation of standards, which are strongly promoted by the WTO TRIPS Agreement and the TBT Agreement respectively. The discussion on this issue presents a number of practical questions on the implementation of these Agreements. The WTO, as an intergovernmental institution, facilitates the implementation of the WTO Agreements and serves as a forum for Members' further negotiations of these Agreements. Therefore, the WTO can play its part in this debate through the work in the TRIPS Council or the TBT Committee.

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<sup>166</sup> WIPO SCP/13/2 (n 3).

<sup>167</sup> WIPO, 'Comments made by Members and Observers of the SCP on Document SCP/13/2 (Standards and Patents)' (27 January 2011) SCP/13/2COMMENTS, paras 3, 26.

<sup>168</sup> *ibid.*

<sup>169</sup> The TRIPS Agreement, art 71. The TRIPS Council initiated its first review in 1999, but has not completed the review, and therefore is unable to initiate any subsequent reviews.

<sup>170</sup> OECD, *Information Technology Outlook 2010* (2010) ch 2: Globalisation of the ICT Sector.

<sup>171</sup> Baisheng An, 'Intellectual Property Rights in Information and Communications Technology Standardization: Highly Profiled Disputes and Collaboration Potentials between the United States and China' (2009) vol 45 *Texas International Law Journal* 175; US-China Joint Fact Sheets on the 25<sup>th</sup>, 26<sup>th</sup> and 27<sup>th</sup> U.S.-China Joint Commissions on Commerce and Trade, available at: <https://ustr.gov/about-us/policy-offices/press-office/fact-sheets/2014/december/us-china-joint-fact-sheet-25th-us>; <https://ustr.gov/about-us/policy-offices/press-office/fact-sheets/2015/December/US-China-Joint-Fact-Sheet-26th-JCCT>; <https://ustr.gov/about-us/policy-offices/press-office/fact-sheets/2017/january/us-china-joint-fact-sheet-27th-us>.

<sup>172</sup> *ibid.* See UNCTAD, 'Trade in ICT Goods and the 2015 Expansion of the WTO Information Technology Agreement' (December 2015) TN/UNCTAD/ICT4D/05.

<sup>173</sup> WTO News 'ICT products at the centre of discussions at standards and regulations committee', available at: [https://www.wto.org/english/news\\_e/news16\\_e/tbt\\_10nov16\\_e.htm](https://www.wto.org/english/news_e/news16_e/tbt_10nov16_e.htm).

Meanwhile, given the nature of the TRIPS and TBT Agreements which are legally binding on all WTO Members, any discussions and solutions among Members, either in or outside the WTO, need to be undertaken in the legal framework of these Agreements. The discussion will pose a number of new challenges for WTO Members on how to adopt a balanced approach to IP protection in the social interest, specially taking into account the interests of patent holders, standard implementers and the general public, so as to allow for the wide use of international standards and to facilitate trade and access to the benefits of innovation.

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