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Technology Standards in China

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Nurturing technology standards is among the central objectives of China's innovation strategy. While China indeed uses standards as a protectionist tool, western companies and countries should pay more attention to Chinese efforts to establish international norms toward minimal payment to the holders of standard essential IPR.

Introduction

Since the 1990s China has been rapidly climbing the global rankings in technology metrics. China stands second only to the United States in R&D spending, academic publications, and patents – a breathtaking rise in the space of only 20 years. In the realm of technology standards, China now seeks a prominent position commensurate with its perceived global status. National plans call for China to become a technology and innovation-based economy by 2020 and to emerge as a world-leading R&D power by 2050. Technology standards development is central to these objectives. There is a widely-held belief in China, that technology-based companies can be divided into three tiers: third-tier companies make products; second-tier companies make technology; first-tier companies make standards (三流企业做产品;

二流企业做技术; 一流企业做标准). Western firms currently dominate the first tier; China seeks to have its firms attain the same heights.

Chinese efforts to develop unique technology standards and rapidly increasing activities as a participant in international standardization efforts have drawn widespread, often negative, attention. China indeed commonly uses technology standards as a protectionist tool. However, a complete view of the standardization system reveals that: i) protectionism is not the major focus of Chinese standards development efforts, and ii) it is not the main challenge China pose to Western firms. Instead, western companies should focus more on the effort of the Chinese to establish new international norms with regards to the licensing fees of standard-essential embedded intellectual property (IP). This brief addresses six critical areas of interest for understanding Chinese technology standards efforts and their implications:

- Technology standardization in China remains legally governed by laws and administrative apparatus developed for, and at the time of, the planned economy.
- Unique or exclusionary technology standards have neither been commercially successful nor fully exclusionary.

- Unique standards efforts are an effective trade tool, particularly in lowering royalty rates for Chinese firms.
- The main challenge China poses in standardization is in establishing new norms, particularly advancement of a cheap royalty options for standards-essential IP.
- China is rapidly increasing its skill and sophistication in global standards organizations and building deep knowledge of their regulations, fostering potential advantages in negotiations.
- An expansive role for the state in in standardization is the accepted norm in China.

Background

Technology standards are agreed-upon technology platforms for interconnection, operation, or function on which other applications, improvements, and innovations can be made. Whether internationally, regionally or nationally developed, common standards protocols are necessary for electronic devices to communicate and exchange data. Technology standards can be divided into market-based or de facto and formal or de jure standards. De facto standards such as Microsoft's Windows are set through market competition where the winning standard pushes competitors out. De jure standards are developed set, and administered by institutionalized technology standards bodies; these can be national governments, non-governmental organizations with global membership, such as IEEE, or state membership-based bodies such as the International Telecommunication Union (ITU). As many technology standards protocols require the use of proprietary technology, the inclusion of protected intellectual property in technology standards is usually done using the good faith disclosure principle. Companies whose representatives are taking part in the development of a standard, or which are active in technology areas covered by a prospective standard, are expected to proactively disclose any patents which may be infringed by the proposed standard. Good faith disclosure aims to prevent ex post hold up of standards by firms which belatedly declare they have relevant patents and demand high royalties. Protected technologies can be incorporated into standards through multiple means of licensing,

most frequently using the (F)RAND principle: (Fair) Reasonable and Non-Discriminatory. If a firm refuses to license, a standards body must "invent" around the offending patents.

China's structure for technology standardization dates to the 1980s when the National People's Congress developed and approved two sets of legislation which defined the legal and agency structure for Chinese standardization: the Patent Law (1984) and the Standardization Law (1989). The Patent Law has since been amended three times, taking into account the growth of the market economy and the increased role of business R&D. The most recent amendments proposed have worried foreign firms in China. The text appears to mandate licensing of proprietary technologies for any firms which participate in standards development activities. Since such licensing may be on unfavorable terms, many foreign firms have balked at this requirement for participation in standards development organizations. This controversial amendment is currently under review, and has not yet been adopted.

The Standardization Law has not been amended since 1989. The law was developed and debated at a time when Chinese standards were largely indistinguishable from regulations, and technology standards were not seen as potential areas for economic competition. Hence, it is vague in many key areas such as how to manage IP in standards or competition between different standards in the same technology. In keeping with the time of its development, the law places the state, specifically the Standardization Administration of China (SAC), at the center of standardization efforts. SAC is to initiate, guide, and approve national standardization efforts. Trade (industry) standards are initiated, guided, and approved by industrial ministries, most notably, the Ministry of Industry and Information Technology (MIIT). The law does not even address intellectual property, licensing, and the role of industrial standards alliances. These areas are open to interpretation and divergent practices by standards development organizations. While this may permit policy innovation, vagueness also increases the uncertainty among would-be standards developers and adopters since the state has not made it clear which policies or practices are legally enforceable. Crucially, and with great market implications, the law allows for two

types of standards: compulsory and voluntary. Compulsory standards have the force of law and can bar non-compliant products from the market. It is widely feared compulsory standards will be used for protectionism or to force technology transfer from foreign companies.

Unique Standards and Protectionism

With these laws in mind, unique Chinese standards development efforts, particularly in information and communication technologies, including TD-SCDMA (Mobile), WAPI (Wireless LAN encryption), and AVD and CBHD (Digital disc players) have attracted wide attention. Many see these standards as direct outgrowths of China's "indigenous innovation" policy, designed to increase the technology innovation capabilities of Chinese firms. The policy of promoting indigenous innovation is not clear-cut, as there is no universal agreement on what constitutes indigenous innovation or how to best promote it.

Once developed, unique Chinese standards performances have generally been underwhelming. All have been market failures in the sense that none have gained significant market support outside of China; most have limited success even within China. There has not yet been a clear case where mandatory standards have resulted in a significant protectionist boon for the sales or royalties of Chinese enterprises. Further, even strongly promoted "indigenous" standards incorporate significant amounts of foreign intellectual property. For example in the 3rd generation mobile telecommunication standard, TD-SCDMA, foreign firms' patents constitute the majority of IPR. Although the exact breakdown of total essential patents is hard to determine, China's leading developer of TD-SCDMA, Datang Telecom, only contributed 9% of the patents included in the standard. Nokia, Ericsson, and Siemens, by contrast, provided sixty-six percent of the total patents for the standard.

However, unique Chinese standards successfully serve as a trade tool. As export processors, Chinese firms specialize in the final assembly, packaging, test, and shipment of completed products. For these goods, Chinese manufacturers are subject to the licensing requirements of different standardized technologies. In commoditized industries such as consumer

electronics, licensing fees squeeze already thin profit margins. In DVD players, for example, licensing fees made up more than half of the wholesale price. Development of low cost and potentially competitive standards for similar or identical technology niches has pushed foreign standards alliances to lower royalty rates. Overseas firms have lowered rates to preempt the emergence of a rival technology. From DVDs to digital media encoding to telecommunications equipment, presence of a competing Chinese standard has successfully lowered the rates for manufacturers.

Intellectual Property Policies, Practices, and Implications

The greater potential challenge from Chinese standards efforts is in their broader evolving approach to embedded intellectual property. China's Patent Law permits inclusion of proprietary technologies in standards, but the terms under which firms are obligated to license remain ambiguous, an area of great concern and contention for foreign enterprises interested in participating in standards development work in China. As stated above, the fear is that recent proposed changes would mean that the mere act of participation would obligate firms to license their intellectual property. Under the current ambiguous legal environment, IP policies are the responsibility of the various standards development organizations and industry alliances. Each of these organizations is developing its own policies. Formally, all groups accept and conform to RAND principles but preference is often given to technologies whose IPR is offered on either royalty-free or minimal and set-price royalty basis. Similarly, some standards development alliances, and even government sponsored standards development organizations such as the Chinese Electronic Standards Institute have begun using and promoting patent pools which set very low royalty rates for embedded essential IP. The overall policy is toward the establishment of norm of set, free or nominal (e.g., less than one euro for the licensing of all IPR in a given standard), cash-option on the licensing of essential standards' IP.

It is in its potential reshaping of norms for standards-essential IP that China's ascent poses a real challenge to established global practices. The Chinese low-priced IP approach emphasizes IP as just another factor of production,

not as a direct source of profit or unique competitive advantage. As a factor of production, the aim of producers is to lower its price to the minimum, which would (hopefully in the Chinese eyes) increase the profit margin of equipment producers.

These norms may gradually extend to the international level as China is rapidly increasing its skill and sophistication in global standards organizations. The China National Institute for Standardization is developing masters-degree programs in technology standardization. These programs train engineers to focus on the legal and policy aspects of technology standards development. Deep understanding of the laws and regulations surrounding standards increasingly make Chinese contributors highly effective in promoting China's interests in international standard setting bodies. China is not only developing standards for use within China, it is pushing to the incorporation of Chinese technology into international standards or the approval of existing Chinese national standards as international ones.

The (Proper) Role of the State in Standardization

The guiding force behind these developments is the Chinese government. However, the means by which it does so are not through mandate and fiat. China's overall strategy for standards is state-centric and regulation-based while still officially endorsing the essential role for the market in determining which standards will be created and adopted. Interviewees confirmed that the market must lead because the state cannot force companies to purchase only products utilizing a given standard. Hence, even state-promoted Chinese standards must conform to market reality. Nonetheless, there is still strong emphasis on encouragement, prodding, and direction from the state. Normatively, Chinese businesses expect a strong role for the state. In interviews, it was noted that if the state did not take an interest in standardization or declare it to be a priority, it would be broadly ignored by Chinese industry.

The use of state power in standards-making is intended to give Chinese firms an opportunity to develop and test technologies domestically before seeking their inclusion in international standards. At a basic level, standards develop-

ment efforts only become official – and able to win attention from potential adopters – when they receive a number from SAC or an industrial ministry. Ministries, and to a lesser degree SAC, are also financial sponsors of standardization efforts. While frequently small amounts in the eyes of big companies, the grants for standards work are great incentives for smaller enterprises and researchers to invest time and effort in standardization. This has encouraged a broader awareness of standardization activities and increased participation by smaller firms, many of which did not have routinized R&D capabilities beforehand.

While most actors agree the state does, and should, play a role in standardization efforts, stakeholders differ on the recommended degree of state intervention. As China's industry increases its technological sophistication and deepens its ties with international standards bodies, many in the private and semi-private sector support a less intrusive government role. For industrial ministries such as MIIT, there remains strong support for active engagement in the standardization process. Many Chinese companies and research labs hold that newcomers, even with quality technology, are unfairly discriminated against in the international arena. Since foreign enterprises have years of experience in R&D for technology standards, their technologies and proposals are more mature than those from Chinese firms. Hence, the argument goes, there is a need for the state to use indigenous standards as a way of buying time for the domestic technologies and proposals to similarly mature so that they can compete internationally.

China's standardization system is state-led, but it is not completely state controlled. Based on an ambiguous legal structure, it favors a new norm of inexpensive technology. It enshrines the central role for the government while also endorsing a need for market forces. The future of the standardization system is yet uncertain as some of the more unique elements of China's approach may be temporary as Chinese firms participate more actively in international standards setting. However, its growing impact on global technology standard setting and its coordinated push toward the establishment of a low-cost cash option licensing fee for essential standard embedded IP will have long term consequences.