

# Technical Standards: A New Realm of China's International Influence?

## Tim Rühlig

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For a long time, technical standardization was largely neglected in political discussions. By and large, technical specifications seemed to be a boring issue from a political viewpoint. In recent years, however, technical standards turn into a central theme of discussions over the emerging technology rivalry between the United States and the People's Republic of China (PRC). Similarly, the European Union (EU) is identifying the subject to be of crucial importance.

The fact that technical standards have long been ignored is not surprising because the political relevance of technical standardization is not self-explanatory. Technical standards are omnipresent technical product specifications. The A4 standard paper format allows the same printers to be used in many, though not all countries. USB is a standard for cables, connectors and protocols that enables charging and the exchange of data on a wide range of devices, regardless of manufacturer. Similarly, Wi-Fi is a family of radio technologies built on technical standards that allow for wireless local area networks of a wide range of technological equipment. In short, technical standards allow products of all kinds to be used in a wide range of contexts across countries and manufacturers. Hence, technical standards facilitate and shape the globalization of production and boost international trade. Technical standards are omnipresent and without doubt important. However, they are primarily technical product specifications. So, how are they political?

This question is even more relevant given that technical standards are legally non-binding. Technical standards can be established in two different ways. First, they are the result of negotiations among private associations, largely comprising commercial firms. In these institutions, engineers assess different technological innovations that could serve as a technological basis for safety and interoperability. The ideal-typical technical standardization should provide the best technical solutions to common problems resulting from the lack of interoperability. The result of these negotiations are formal standards. Second, technical standards can be the result of the market dominance of a given company's product, which serves as the basis for many other products. We can speak of de facto standards. Crucially, both types of standards are the result of private actors' operations. In a word, technical standards are private self-regulation. How do such standards impact the technology competition between



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For example, diverging technical standards for power sockets make the world complicated while the universal USB standard helps create interoperability. How can technical standards that aim for unity be tools in the emerging technology competition? Why do they feature in the current debate over the US-China competition? How is PRC's role in standard-setting growing? How does it reshape the very nature of international standardization?

### Four dimensions of technical standardization power-

Technical standards carry political force. Strikingly, the transformative power of technical standards lies not only in the fact that they are seldom abolished and replaced by new ones, but also by the fact that their political nature is not self-evident. The real political power of technical standards lies in their discreet political implications.

States have developed a strong interest in technical standards because the ability to shape them comes with at least four implications that increase state influence more broadly. This includes economic, legal, political, and ideational implications.

Economically, it is widely acknowledged that technical standards have distributary effects. Technical standards are available to everyone. However, many standards are not free of charge. Instead, the technical specifications can be purchased from standard developing organizations (SDOs). Some standards are patented. This is particularly widespread for technical standards in the field of information and communication technology (ICT) that are of tremendous importance in the ongoing digital revolution. For example, standards that used to be crucial for mobile phones only are now building into smart appliances such as cars. Around 55% of all ICT standards are patented technology. These standard-essential patents (SEPs) are licensed under fair reason-

the two great powers? Moreover, technical standards follow a different logic than most of the methods of the US-China technology rivalry. Instruments such as export controls, sanctions or punitive tariffs adopt an exclusionary logic since they aim to either increase the cost of the rival to access a technology or cut the adversary from the entire supply. Technical standards, in contrast, are inclusive. The strength of a technical standard lies in a broad consensus, ideally among all manufacturers.

able and non-discriminatory (FRAND) terms. In other words, patent holders cannot deny access to their patents if they are standard essential and they have to charge reasonable prices. However, SEPs licensing is not a minor issue but can impact the competitiveness of firms that are of systemic importance to national economies. Technology giant Qualcomm, for example, makes around 20% of its revenue with royalties. Furthermore, manufacturers that have developed products that are not in conformity with technical standards often face the necessity to adapt their innovation in order to remain interoperable and competitive. Hence, the ability to shape technical standards can have a significant impact on the competitiveness of a national economy given the importance of royalties and adaptation costs. States, in turn, can utilize their economic strength to further international influence.

Legally, technical standards are non-binding, but they can carry de facto judicial power. Many standards are referenced in mandatory regulations. These references make the standards themselves not legally binding but complying with technical standards is often the cheapest method to prove compliance with a given regulation. Standards that are referenced in regulations of large markets such as the US, China or the European Single Market, often carry de facto extraterritorial effects because multinational companies strive to sell the exact same product around the globe and often choose to comply with the strictest standard. Also, international technical standards can serve as benchmarks for technical barriers to trade under WTO law. Hence, whoever sets technical standards de facto influences international trade law. States whose companies write these standards have a stronger impact on international trade law improving their international influence.

Politically, technical standards can come with lock-in effects. As long as technical standards are global in scope, they "even out" trade restrictions. However, when technical standards only apply to certain geographical areas they create "corridors" in which different technical solutions are the norm that can be incompatible. This is politically insignificant only as long as it does not affect strategic products or technologies. However, if critical infrastructure is based on technical standards of only one country, this critical infrastructure can only be maintained and further developed by manufacturers applying the respective standard. One such critical infrastructure, in which international standards are lacking, is railway. China utilizes this situation by funding several Belt and Road Initiative (BRI) railway projects requiring the adoption of Chinese standards. The result can be technological dependencies that force states to carefully consider the political sensitivities of the host country that supplies it with critical infrastructure. Furthermore, technical standards can include components that are relevant for security, particularly cybersecurity. Hence, if companies of a given state set technical standards this can come with political benefits resulting from lock-in effects or by defining which components are to be included in standardization, even if they are security-relevant. For example, the US is currently

discussing whether China's strength in 5G standardization is to the disadvantage of the US military that is relying mostly on mmWave 5G standards (notably because different wave forms of 5G could have distinct security implications.)

Finally, technology is not value free. Different technical solutions carry divergent implications. A technology can prioritize different aspects over others. For example, we are used to Wi-Fi as a global standard to connect our devices to wireless local area networks. This has not been without alternative. China proposed the WAPI standard that promises better performance but is weaker on privacy. The Chinese proposal was rejected mainly on procedural grounds. This decision illustrates that technical standardization carries ideational implications. Companies developing technology operate within specific ecosystems. Chinese companies develop their innovation primarily along the rules and values of the Chinese market. Hence, Chinese technical standardization proposals are more likely to incorporate technology that conforms with political and societal values predominant in China. If Chinese standards are internationalized these technological solutions inherently export their underlying values. Technical standards appear to be technical rather than political and tend to be long-lasting. Hence, whoever sets international technical standards spreads its values and giving standards a transformative function.

These dimensions of technical standardization power raise the question which entities shape technical standard setting. Is the widespread concern of China's growing footprint justified?

### **Is China transforming the world by means of standards?**

In technical standardization, China is a latecomer and Western countries continue to be stronger than the PRC. Measuring the current state of influence is complex. There is more than one method to measure China's footprint in technical standard setting. Technical standardization spans a wide range of products and technologies and the PRC, just like any other state, is not leading in all of them. Cutting-edge innovation is not a sufficient but a necessary condition to shape standardization. By and large, China's global footprint in technical standardization increases in parallel to its growing innovativeness though the PRC is not dominating. China is particularly strong in sectors that it has identified as strategic.

In terms of general leadership positions, Chinese citizens are currently heading two of the most influential global standard developing organizations, namely the International Electrotechnical Commission (IEC) and the International Tele-

communication Union (ITU). From 2015 to 2018, a Chinese citizen was for the first time the president of the third major international SDO, the International Standardization Organization (ISO), in which China became a permanent member of the ISO Council in 2008 and the Technical Management Board in 2013.

Of more practical importance is China's increase in technical leadership positions. Standards are developed in Technical Committees and its subordinate bodies. Secretariats of these technical institutions carry enormous practical influence in the standardization process. While the PRC still falls short of secretariat positions in ISO and IEC compared to leading standardization nations such as Germany, the United States, Japan, France and the United Kingdom, its share is growing steadily.



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In terms of participation in international standardization committees, China's presence has rapidly grown. For example, in ISO, the PRC only falls short of the United Kingdom and Germany. In another SDO focusing on mobile networks, the Third Generation Partnership Project (3GPP), China accounts for the highest number of participants outcompeting all of the EU and the US. When standard contributions to a key-enabling technology such as 5G is considered, China's share is only outcompeted by the combination of all EU member states. While not all proposals are being accepted they are widely considered to provide a rough estimation of influence in the process. In terms of 5G SEPs declarations, the PRC is clearly leading.

Outside of established SDOs, China strives to internationalize its technical standards as part of the Belt and Road Initiative. In 2015, China's main macroeconomic agency, the National Development and Reform Commission (NDRC), issued its first "Action Plan for the Harmonization of Standards along the Belt and Road." At the end of 2017, the NDRC published another action plan to set further benchmarks to be fulfilled by the end of 2020. As part of the plan, China began to translate its domestic technical standards into foreign languages to facilitate their adoption in third countries. By September 2019, China had signed 90 bilateral agreements on technical standardization cooperation with 52 countries and regions. More importantly, BRI infrastructure projects are designed based on Chinese technical standards, as investments are tied to Chinese construction firms that rest on Chinese standards, establishing them de facto in the respective country.

A major state-sponsored research project, "China Standards 2035," is expected to suggest the establishments of a regional technical standardization organization, the BRI Standards Forum, that could develop BRI Regional Standards. Whether

such a forum could fulfill the ambitious goal of developing regional standards that are acknowledged along the BRI remains to be seen. The Forum, if established, could also simply serve to coordinate activities in ISO and IEC with the potential to further strengthen Chinese influence in these institutions.

In sum, while China is far from dominating international technical standardization its impact is clearly on the rise both within and outside established SDOs.

### Implications and future directions

China's growing footprints in international technical standardization come with international influence. Hence, the PRC's approach facilitates the country's rise to great power status and is a central feature of the emerging competition over high technology. Traditionally, Europe has been strong in international technical standardization. Hence, EU influence is without doubt at stake.

However, the EU is not only facing diminishing influence in standardization. China has adopted a state-centric approach to standard-setting. In contrast to the West, Chinese technical standards are developed in a two-tier system of state-run pillar and a market-run pillar. While the former refers to three types of standards developed in institutions under different party-state institutions (e.g., ministries), the latter pillar is also not free of party-state influence. The PRC has carefully studied Western practices of standardization, adapted it to its own state-centric economic model and is now about to externalize its own approach. In this situation, the EU should strive to improve conditions for innovation and standardization within Europe. In this context, timing is crucial. Particularly for key-enabling technologies of the digital revolution, Europe should identify strategic fields, facilitate the coopera-

tion between universities in which technological innovation is driven forward with standardization, promote standardization education, provide a regulatory framework that allows early commercialization, and not least support industry by providing funding for standardization where necessary and in the EU's interest. The Union should further continue to engage the PRC in the existing system of standardization insisting on international rules and procedures as well as reciprocity.

Finally, the EU could more actively engage with like-minded partners in countering politicization and bifurcation of technical standardization in order to preserve its traditional strength. This does not imply that Europe should not seek a political dialogue over strategic issues on technical standardization, for example in the proposed EU-US Trade and Technology Council, but the actual development of standards needs to remain non-political. After all, decoupling in the field of standardization is not in Europe's interest and cooperation with China is in place (e.g. as carried out in bilateral formats of Germany, France or Britain with China). What the EU should strive for, however, is to be better prepared of the strategic implications of such cooperation.

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