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Global Rivalry over Leadership in ICT Standardization

SDO Governance amid Changing Patterns of Participation

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14.1 INTRODUCTION

Recent years have witnessed geopolitical tensions resulting from China's rapid ascension to technological power. The increasing technological influence of Chinese companies is particularly apparent in the development of global technology standards in information and communication technologies (ICT). ICT standards codify specifications for interoperability among various technological components and prescribe methods applied in electronic devises;[1] notable examples include wireless LAN specifications, internet protocols, and cellular networks such 4G/LTE and, more recently, 5G.

Influence over the development of ICT standards is potentially highly valuable to commercial stakeholders – inclusion into a standard may increase the value of certain patented technologies;[2] and standard specifications may provide certain firms' products with a competitive advantage. Competition for leadership in ICT standards development has thus long been characterized by rivalry between large commercial stakeholders. At the same time, and with the significantly increasing participation of Chinese companies in many standards development organizations (SDO), there is a growing geopolitical dimension to this commercial competition.

Particularly in the United States, the important role of Chinese companies, most notably Huawei, in ICT standards development has fueled a variety of policy initiatives intended to curb the influence of Chinese actors and bolster the position

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[1] Based on the definition by M. A. Lemley, Intellectual Property Rights and Standard-Setting Organizations (2002) 90 *California Law Review* 1889, at 1889.
[2] See, among many others, J. Lerner and J. Tirole, Standard-Essential Patents' (2015) 123 *Journal of Political Economy* 547.

of US stakeholders in international standardization. To illustrate, US government officials have testified that the increasing number of SDO leadership positions held by Huawei affiliates may enable the adoption of standards that disadvantage the market position of US companies.[3] The growing representation of Chinese companies in SDOs was also discussed in the proposals for the recent US Innovation and Competition Act.[4] More recently, the National Institute of Standards and Technology (NIST) has been tasked to study and provide recommendations with respect to the effect of China's standardization policies on, and the engagement of Chinese stakeholders in, international SDOs, especially those developing standards for emerging technologies.[5]

These policy initiatives furthermore take place in the context of allegations that Huawei and other Chinese technology companies may present risks to US national security interests. In this light, some Western countries, including the United States, adopted a number of restrictive measures, ranging from the bans on (telecommunications) equipment supplied by Chinese manufacturers and that pose a threat to national security,[6] to Huawei's listing on the US Export Administration Regulation (EAR) entity list, prohibiting it from supplying components for essential communications infrastructure.[7] Also these tensions have not gone unnoticed in SDOs, not least because restrictions on the exchange of technical information with entities on

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[3] See, among others, the testimony of Christopher Krebs, Director of Cybersecurity and Infrastructure Security Agency, during the hearing of the Committee on the Judiciary, 5G: National Security Concerns, Intellectual Property Issues, and the Impact on Competition and Innovation (May 14, 2019), www.judiciary.senate.gov/imo/media/doc/Krebs%20Responses%20to%20QFRs.pdf; the statement of Jonathan E. Hillman, Senior Fellow, Simon Chair in Political Economy, and Director, Reconnecting Asia Project, CSIS, before the US-China Economic and Security Review Commission (January 25, 2018), www.uscc.gov/sites/default/files/Jonathan%20Hillman%20Written%20Testimony%203.13.20.pdf, providing examples of International Telecommunications Union (ITU), Food and Agriculture Organization (FAO) and the International Civil Aviation Organization (ICAO).

[4] 117th Congress, United States Innovation and Competition Act of 2021, S.1260 (adopted June 8, 2021).

[5] Study on People's Republic of China (PRC) Policies and Influence in the Development of International Standards for Emerging Technologies, Federal Register, notice of NIST published on November 4, 2021, www.federalregister.gov/documents/2021/11/04/2021-24090/study-on-peoples-republic-of-china-prc-policies-and-influence-in-the-development-of-international.

[6] See H.R. 4747, 115th Congress (2018); Federal Acquisition Regulation; FAR Case 2018-017, Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment (August 7, 2019), at 48 C.F.R. pts. 1, 3, 12, 13, 39, and 52 (prohibiting federal agencies to purchase Chinese telecommunications equipment) and, more recently, Federal Communications Commission, Report and Order, Order, and Further Notice of Proposed Rulemaking (November 11, 2022) FCC 22-84, ET Docket No. 21-232.

[7] 85 Fed. Reg. 42665 Federal Acquisition Regulation: Prohibition on Contracting with Entities Using Certain Telecommunications and Video Surveillance Services or Equipment (July 14, 2020), at 48 C.F.R. pts. 1, 3, 12, 13, 39, and 52.

the EAR entity list may preclude Huawei's affiliates from taking part in certain activities of the standardization process.[8]

It has long been recognized that ICT standards can have significant political implications and can be used as tools of national or regional industrial policy.[9] Leadership in the development of international ICT standards may thus provide opportunities for "regulatory export," a strategy of promoting the international diffusion of domestic regulations. It is thus not surprising that policymakers view the possibility of Chinese stakeholders acquiring significant influence over ICT standards development as a particular cause for concern.

In this chapter, we argue that the tensions that result from China's, and in particular, Huawei's increasing representation in standardization processes, as well as the policy reactions that they generated, create "a moment of stress"[10] for the normal functioning of SDOs. In addition to causing frictions in the daily business of SDOs, these dynamics challenge seemingly well-established governance principles of the standardization ecosystem.

Scholarly commentary has highlighted institutional features of SDOs, such as the openness and transparency of technical deliberations, the representation of a wide diversity of interests, and the fact that technical decisions are reached by consensus,[11] which seem to counter the suggestion that certain Chinese stakeholders may exercise undue influence within these SDOs to negatively affect US national security interests. Nevertheless, the recent tensions around increasing Chinese participation in SDOs expose fragilities in the existing norms of SDO governance. All this calls for an empirical analysis of SDOs' governance processes to better assess these organizations' aptitude to adapt to the present situation of institutional crisis.

This chapter aims to advance the understanding of the current power dynamics in SDOs by explaining the rules, processes, and traditions of four global SDOs, namely: the International Telecommunication Union (ITU), 3rd Generation Partnership Project (3GPP), Institute of Electrical and Electronics Engineers (IEEE), and the Internet Engineering Task Force (IETF). The reasons for selecting these SDOs are the following: firstly, they span across the spectrum of SDO governance models, ranging from an intergovernmental agency to an informal

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[8] E.g., IEEE, Compliance with US Trade Restrictions Should Have Minimal Impact on IEEE Members Around the World (May 29, 2019), www.ieee.org/about/news/2019/compliance-with-us-trade-restrictions.html?utm_source=twitter&utm_campaign=huawei&utm_medium=social; 3GPP, Statement regarding Engagement with Companies Added to the U.S. Export Administration Regulations (EAR) Entity List in 3GPP activities (June 3, 2019) (both statements have been subsequently revoked or reversed following the adverse reaction of the SDOs membership).

[9] See, e.g., M. Cantero Gamito, Europeanization through Standardization: ICT and Telecommunications (2018) 37 *Yearbook of European Law* 395.

[10] See, generally, P. Delimatsis, "The Resilience of Private Authority in Times of Crisis" in this volume (Chapter 1), defining the events of crisis.

[11] See O. Kanevskaia, *The Law and Practice of Global ICT Standardization* (2023); J. Yates and C. N. Murphy, *Engineering Rules: Global Standard Setting since 1880* (2019).

group of internet experts. Secondly, they have recently sparked off the debates regarding the increasing role of Huawei, and Huawei's affiliates, in their standardization decisions. In particular, our analysis focuses on the rules for leadership appointments and expected conducts of individuals holding critical positions in SDOs. In a broader sense, this chapter contributes to the debate on the neutrality, independence, and trustworthiness of SDOs in the light of the global commercial and geopolitical rivalry in the ICT sector.

14.2 THE RISE OF CHINA AND HUAWEI AS GLOBAL TECHNOLOGY LEADERS

Over the past few years, participation by Chinese individuals and organizations in international ICT standards development has significantly increased.[12] Two factors have contributed to this evolution: first, the fast growth of the Chinese ICT industry and, second, structural and institutional changes in China' national industrial and technology policy,[13] often categorized as an evolving process of "techno-nationalism."[14] Chinese industrial policy had long sought to reduce dependence of China's companies on foreign technologies through the development of indigenous alternatives to Western standards, for example, for 3G (TD-SCDMA) and 4G (TD-LTE) technology.[15,16] Current Chinese standardization policy by contrast incentivizes Chinese stakeholders to participate in the development of international technology

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[12] See, e.g., J. L. Contreras, Divergent Patterns of Engagement in Internet Standardization: Japan, Korea and China (2014) 38 *Telecommunications Policy* 914.

[13] See J. Xia, China's Telecommunications Evolution, Institutions, and Policy Issues on the Eve of 5G: A Two-Decade Retrospect and Prospect (2017) 41 *Telecommunications Policy* 931; D. Breznitz and M. Murphree, The Rise of China in Technology Standards: New Norms in Old Institutions (2013), www.uscc.gov/sites/default/files/Research/RiseofChinainTechnology Standards.pdf, discussing China's rapid industrial development and success in innovation technology.

[14] M. Kim, H. Lee, and J. Kwak, The Changing Patterns of China's International Standardization in ICT under Techno-nationalism: A Reflection through 5G Standardization' (2020) 54 *International Journal of Information Management* 1021. For further explanations of the term "techno-nationalism," see M. Kohno, Ideas and Foreign Policy: The Emergence of Techno-nationalism in US Policies toward Japan (1995) *National Competitiveness in a Global Economy* 199, S. Ostry and R. Nelson, *Techno-nationalism and Techno-globalism: Conflict and Co-operation* (1995).

[15] In particular, when it comes to the supply of technologies that are essential for the implementation of ICT standards for which Chinese firms had to pay royalties; see D. Breznitz and M. Murphree, *Run of the Read Queen; Government, Innovation Globalization and Economic Growth in China* (2011). See also, among others, Kim et al., *supra* note 15; M. Murphree and D. Breznitz, Indigenous Digital Technology Standards for Development: The Case of China (2018) 1 *Journal of International Business Policy* 234; X. Liu and P. Cheng, National Strategy of Indigenous Innovation and its Implication to China (2014) 3 *Asian Journal of Innovation and Policy* 117; D. Ernst, Indigenous Innovation and Globalization: The Challenge for China's Standardization Strategy (2011), www.eastwestcenter.org/sites/default/files/private/ernstindigen ousinnovation.pdf.

[16] Liu and Chen, *supra* note 16.

standards:[17] the recent "China Standards 2035" initiative, for instance, encourages Chinese stakeholders to lead the development of global standards for critical telecommunications technologies as well as for emerging technologies, such as artificial intelligence.[18]

It is against this backdrop that the aforementioned claims of China's increasing influence in SDO processes arise. However, for any further discussion regarding the resilience of these processes, it is important to assess these concerns in light of empirical evidence.

14.2.1 *Empirical Evidence on Chinese and Huawei's Participation in SDOs*

Our data suggests that the increasing Chinese participation in international SDOs is reflected in a general increase in the share of Chinese individuals among attendees of international SDOs, such as 3GPP, IEEE-SA 802.11, and IETF.[19] Nevertheless, individuals from Western countries continue to represent a significant majority of the attendees in each of these SDOs (Figure 14.1).

Earlier studies demonstrated that increasing Chinese participation in SDOs has translated into an increasing share of Chinese stakeholders in SDO leadership positions, most notably in the intergovernmental ITU,[20] where it has also introduced a large number of standardization proposals.[21] In the past decade, the number of Chinese stakeholders holding secretariat positions in the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) technical committees has increased by nearly 70 percent.[22] However, the recent number of leadership positions held by Chinese stakeholders in the technical bodies of ISO and IEC seems not have increased dramatically or even

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[17] Kim et al., *supra* note 15, at 4–5.

[18] See the NIST notice, *supra* note 5

[19] For methodology and detailed explanation of the empirical findings, see J. Baron and O. Kanevskaia , Global Competition for Leadership Positions in Standards Development Organizations, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3818143; and J. Baron, Participation in the Standards Organizations Developing the Internet of Things: Recent Trends and Implications, in *Shaping the Future through Standardization* (K. Jakobs ed., 2019) 117–147.

[20] M. Cantero Gamito, From Private Regulation to Power Politics: the Rise of China in AI Private Governance through Standardisation, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3794761.

[21] See J. Wouters, "Corporations and the Making of Public Standards in International Law: The Case of China in the ITU" in this volume (Chapter 3).

[22] ANSI, Comments on the Request for Information on the Study on People's Republic of China (PRC) Policies and influence in the Development of International Standards for Emerging Technologies (December 6, 2021), at 3, citing the report by the US-China Business Council 'China in International Standard Setting' (February 2020), www.uschina.org/sites/default/files/china_in_international_standards_setting.pdf.
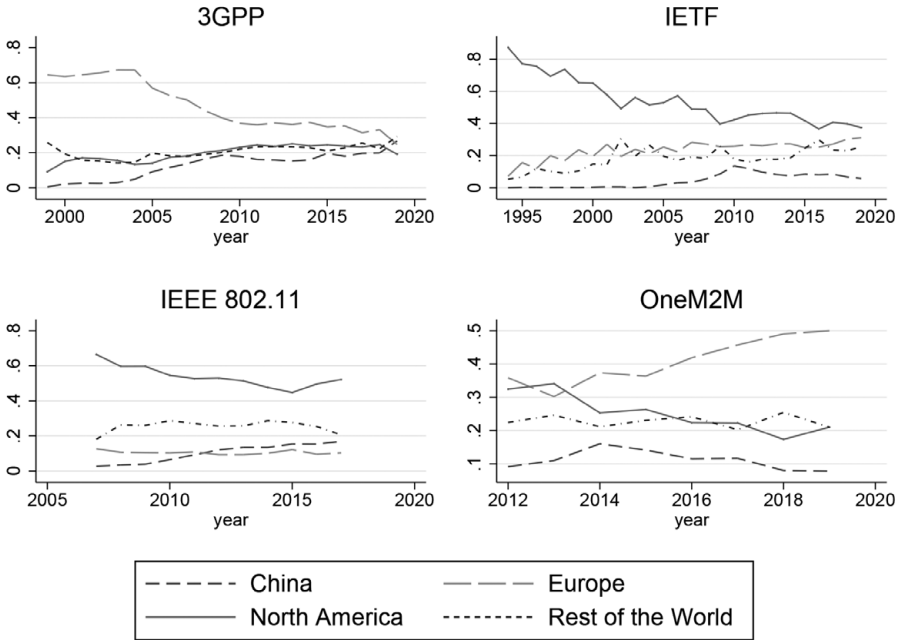
FIGURE 14.1. Trends in SDO meeting attendance

declined, despite the fact that China has undertaken new chair positions and secretariats in these SDOs.[23]

A similar observation can be made from our data: at 3GPP, IETF, and IEEE 802.11, the share of Chinese individuals among SDO working group chairs significantly trails the share of Chinese among attendees, demonstrating no disproportionate representation of Chinese individuals in the leadership of these three SDOs (Figure 14.2).

One must note, however, that most policy discussions focus specifically on Huawei. In this regard, our empirical evidence suggests that while individuals from Europe and North America are affiliated with many different organizations, the affiliations of SDO participants from China are significantly more concentrated, with Huawei holding a disproportionate share. As a consequence, Huawei was, in the most recent years, the single affiliation with the largest number of attendees in each of these SDOs. Similar to other large companies, Huawei affiliates are generally over-represented in working group chair positions (Figure 14.3).

Furthermore, in different SDOs, Huawei-affiliated individuals have been appointed to particularly influential roles. In ITU, this included the chair of important committees, such as ITU-T SG16 on AI-enabled multimedia applications

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[23] Ibid. "By the end of 2020, China had undertaken the chairmanship and vice chairmanship of 75 ISO and IEC technical bodies (compared to 73 by 2019 as listed in the 2019 report) and 75 secretariats (88 by 2019)."
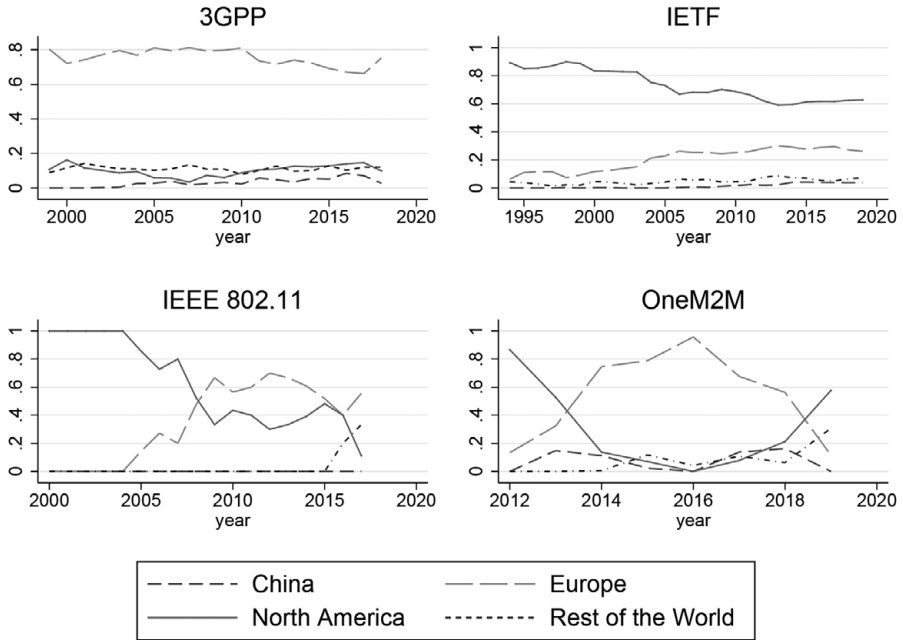
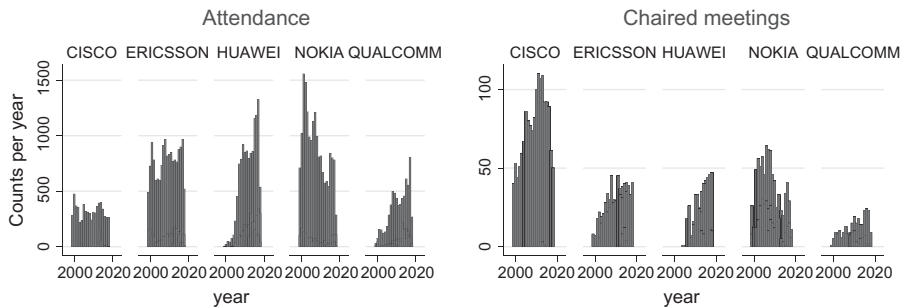FIGURE 14.2. Trends in chairs appointments of SDO meeting

FIGURE 14.3. Meeting attendance and chair appointments of five largest stakeholders in 3GPP, IEEE, OneM2M, and IETF

and ITU-T Focus Groups on AI standardization.[24] Individuals affiliated with Huawei or associated companies have also been nominated for the IETF chair election in 2021.[25]

The empirical evidence also suggests that Huawei is not unique in holding large numbers of leadership roles in these SDOs. At 3GPP, Ericsson, Nokia, and

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[24] Focus Groups support standardization work of the SG in a specific domain and are comprised of non-ITU members; however, such FG may go "beyond their terms of references" and leading them may be one of the many strategies to steer the activities of a SG.

[25] M. Ermert, Diversity at Any Price? IETF Looking for New Chair (December 16, 2020), www.centr.org/news/blog/ietf109-new-chair.html.

Qualcomm also hold larger number of leadership positions; while at IETF, Cisco continues to hold a leading position both in terms of attendance records and chair positions. Empirically, what sets Huawei apart from its main competitors is the breadth of Huawei's engagement – Huawei's lead in attendance records in the three SDOs marks the first time that one company leads attendance counts in each of these SDOs. Furthermore, the observable data point to future increases in Huawei's position in SDO leadership: as Huawei affiliates attend SDO meetings more assiduously than affiliates of any other company, and Huawei recruited far larger numbers of individuals with previous SDO participation experience than any other company,[26] Huawei is growing a workforce with significant SDO experience. Having this experience is the most important predictor of future appointments to SDO chair positions.

14.2.2 *Huawei's Rise as a Moment of Stress for SDO Governance*

The observable pattern of Huawei's increasing influence in ICT SDOs alone does not constitute an institutional crisis. Several concerns and/or allegations have been raised, which suggest that Huawei's rise represents a challenge to the (current) normal functioning of international SDOs.

First, governmental support of Chinese companies, arguably enabling them to gain competitive advantages in SDOs, is accused of interfering with the competitive process.[27] Second, the increasing role of Chinese stakeholders, coupled with generally lower standards of patent protection in China, is often presented as a threat to the protection of Western companies' patent rights.[28] Third, Huawei and other Chinese stakeholders are seen as promoting certain governance models for the development of ICT standards. To illustrate, Huawei-driven attempts at the ITU to reform the Internet with the "New IP" protocol have been presented as a challenge not only to IETF's traditional prerogative over the development of

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[26] This pattern is in line with Huawei's general strategy of acquiring significant technical know-how through targeted recruitments of foreign technical experts; see K. J. Schaefer, Catching up by Hiring: The Case of Huawei (2020) 51 *Journal of International Business Studies* 1500. E. Gifford, M. Holgersson, M. McKelvey, and S. Bagchi-Sen, Tapping into Western Technologies by Chinese Multinationals: Geely's Purchase of Volvo Cars and Huawei's Hiring of Ericsson Employees in Sweden, in *Innovation Spaces in Asia: Entrepreneurs, Multinational Enterprises and Policy* (M. McKelvey and S. Bagchi-Sen eds., 2015), at 231.

[27] Xia, *supra* note14; H. Farrel and A. Newman, Weaponized Globalization: Huawei and the Emerging Battle over 5G Networks (2019) 14 *Global Asia* 8, www.globalasia.org/v14n03/cover/weaponized-globalization-huawei-and-the-emerging-battle-over-5g-networks_henry-farrellabra ham-newman; Schaefer, *supra* note 23, on how governmental support to Huawei enabled it to expand its sales and build a foreign customer base.

[28] See, e.g., P. K. Yu, *The Sweet and Sour Story of Chinese Intellectual Property Rights* (2004), www.peteryu.com/sweetsour.pdf.

internet protocols but more generally to a nongovernmental, de-centralized, multi-stakeholder model of standards development and internet governance.[29]

In addition to these specific issues, concerns about China's and Huawei's influence in SDOs unfold against the background of a broader discussion on China's role in the global economic order. ICT standardization, for example, in the field of Artificial Intelligence, carries complex ethical implications;[30] and some ICT standards, including 5G, define the performance and resilience of a critical communications infrastructure.[31] In this context, several policy discussions around China's and/or Huawei's leading role in ICT standards development, and the telecommunications infrastructure more generally, focus on potential risks to national security interests, human rights, or political values; as exemplified by multiple cybersecurity incidents allegedly linked to Huawei[32] and unease about the leading role of Chinese stakeholders in the development of international facial recognition standards.[33]

The US policy response to these (perceived) threats to the SDO ecosystem can equally be seen as menacing the normal functioning of SDOs. The exclusion of certain entities from relevant standardization activities and adjacent forms of technology exchange represents a departure from the general principle of openness of the standards development process. Ultimately, it also risks splintering the technical and governance structure of international ICT standardization. Furthermore, at least some of the measures contemplated in the United States in order to counter Chinese influence in international SDOs can themselves be perceived as interference of a national government with the normal competitive process in private international SDOs.

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[29] S. Hoffmann, D. Lazanski, and E. Taylor, Standardising the Splinternet: How China's Technical Standards Could Fragment the Internet (2020) 5 *Journal of Cyber Policy* 239, at 244.

[30] D. Lewis, D. Filip, L. Hogan, and P. J. Wall, Global Challenges in the Standardization of Ethics for Trustworthy AI (2020) 8:2 *Journal of ICT Standardization* 123.

[31] B. Lee-Makiyama and F. Forsthuber, Open RAN: The Technology, Its Politics and Europe's Response (October 2020) ECIPE Policy Brief No 8/2020, https://ecipe.org/publications/open-ran-europes-response/ (explaining that 5G security issues are different than of its predecessors). See also J. Wouters, "Corporations and the Making of Public Standards in International Law: The Case of China in the ITU" in this volume (Chapter 3).

[32] FCC 19-121 in the Matter of Protecting Against National Security Threats to the Communications Supply Chain Through FCC Programs (WC Docket No. 18-89), Huawei Designation (PS Docket No. 19-131), ZTE Designation (PS Docket No. 19-352) release November 26, 2019; European Parliament, 2019/2575 (RSP) Resolution, Security threats connected with the rising Chinese technological presence in the EU and possible action on the EU level to reduce them; K. Kaska, H. Beckvard, and T. Minárik, Huawei, 5G and China as a Security Threat, Report of the NATO Cooperative Cyber Defense Center of Excellence (2019), https://ccdcoe.org/library/publications/huawei-5g-and-china-as-a-security-threat/; Farrell and Newman, *supra* note 24. Whereas these incidents should be seen in isolation from Huawei gaining global technological power, they present a broader picture of possible concerns that may arise from Huawei's participation in SDOs.

[33] A. Gross, M. Madhumita, and Y. Yang. Chinese Tech Groups Shaping UN Facial Recognition Standards (2019), www.ft.com/content/c3555a3c-0d3e-11ea-b2d6-9bf4d1957a67.

14.2.3 *Fragility of Existing Norms of SDO Governance*

The recent tensions around China's and Huawei's increasing participation in the leadership of SDOs developing international ICT standards constitute a "moment of stress" for SDO governance, as both the rising influence of Huawei (and some other Chinese stakeholders) itself as well as the policy response (especially in the United States) to this ascension can be seen as challenging certain institutional norms and governance principles of SDOs.

ICT standardization is characterized by rivalry between different commercial stakeholders with vested interests in influencing the outcomes of standardization processes; it also involves considerable R&D investments. In this highly competitive setting, most SDOs emerge as nongovernmental, nonprofit, voluntary professional and/or industry associations that provide an infrastructure for neutral and nonpartisan deliberation processes. The primary aim of this particular institutional organization of the deliberative process is to promote technical objectivity in standardization decisions.

It is an accepted (and often expected) feature of SDOs that most or all individual participants of the standards development process vigorously pursue different interests. By contrast, it is a violation of institutional norms of standardization if the SDO itself or its agents or representatives side with individual SDO stakeholders or constituencies.[34] From this vantage point, the resilience of the existing SDO ecosystem to the present "moment of stress" hinges on whether the rival commercial and political interests of Chinese and Western stakeholders fuel particularly vigorous competition within the nonpartisan standards development process or whether there is competition for opportunities to influence (and bias) the nature of the deliberative process.

Nevertheless, the supposedly well-established norms separating the partisan activity of SDO participation from the neutrality of the institutional setting are inherently fragile. There have been numerous episodes in which individual SDO chairs have been accused of favoring their company's proposals or otherwise biasing the standardization process.[35] At several occasions, SDOs made decisions opposed by significant stakeholder constituencies, illustrated by the W3C Encrypted Media Extensions (EME) recommendations.[36] The notion of a competitive standards development process taking place within a nonpartisan process is also belied by the hyper-partisan nature of some SDO governance discussions, as illustrated by the

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[34] See M. I. Marpet, An Ethical Issue in Voluntary-Consensus-Standards Development: A Decision-Science View (1998) 17 *Journal of Business Ethics* 1701.

[35] E.g., *American Society of Mechanical Engineers* v. *Hydrolevel Corporation*, 456 US 556 (1982) and, later, *TruePosition, Inc.* v. *LM Ericsson Tel. Co.* (January 6, 2012), No. 11-4574, 2012 WL 33075 [2012].

[36] H. Halpin, The Crisis of Standardizing DRM: The Case of w3c Encrypted Media Extension (2017) *International Conference on Security, Privacy, and Applied Cryptography Engineering* 10.

latest update of IEEE's patent policy and the still ongoing controversy that it has generated.[37]

While appealing, the optimistic representation of the standards development process as a highly competitive process within a neutral institutional framework is thus overly simplistic. For a more thorough assessment of SDOs' resilience to the present "moment of stress," it is important to have a closer empirical look at SDOs' institutional architecture and the drivers of their decision-making.

14.3 SDO GOVERNANCE PROCESSES

Next to a set of formal rules that define SDOs' membership, voting rights, and obligations of SDO participants, the conduct of business within SDO committees hinges upon informal practices and expectations rooted in cultural historical traditions, which determine the hierarchy of operational rules and their interpretation. Furthermore, SDOs usually comprise many committees, which in turn are made up of specialized groups, each of these subcommittees having their own internal ways of working. In this regard, while there are different ways in which SDOs and their standards can be legitimized as instances of private rule-making,[38] it can also be argued that different SDO models present different legitimization techniques.

14.3.1 *Models of SDO governance*

SDO governance is heterogenous.[39] While SDOs appear to share some fundamental governance features, those are further concretized in their operational frameworks in a way that serves their membership and is entrenched in their cultural traditions. Generally, a distinction can be made between four models of SDO governance, often combined in reality.

In the first model, SDOs comprise national committees established at the country level and according to the national rules ("national representation"). This modus operandi is exemplified by the three international SDOs, namely the ISO, IEC, and ITU. National committees participating in these SDOs represent national consensus, as opposed to the interest of a particular stakeholder group. However, SDOs may have different understandings of what the "national consensus" entails: in ITU, for instance, it refers to the interests of States, whereas ISO and IEC are preliminary

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[37] P. Delimatsis, O. Kanevskaia, and Z. Verghese, Strategic Behavior in Standard Development Organizations in Times of Crisis (2021) 29:2 *Texas Intellectual Property Law Journal* 127.

[38] See the analysis of different facets of legitimacy in standardization in M. Eliantonio and C. Cauffman (eds.) *The Legitimacy of Standardization as a Regulatory Technique: A Cross-disciplinary and Multi-level Analysis* (2020).

[39] O. Kanevskaia, *supra* note 12; J. Baron et al., *Making the Rules: The Governance of Standard Development Organizations and their Policies on Intellectual Property Rights*, Report of the EU Joint Research Center (2019), http://publications.jrc.ec.europa.eu/repository/bitstream/JRC115004/sdo_governance_final_electronic_version.pdf.

concerned with consensus among domestic industry actors.[40] SDOs that are based on national representation derive their legitimacy from recognition by governmental authorities, either explicit or by the indirect means of co-regulation[41] or, as it is the case with ITU, from participation of the public sector, that is, ministries and governmental agencies, in their standardization processes.[42] Furthermore, since the national committees are treated equally in terms of membership rights and obligations, such as voting for standards' approval, this type of SDO also enjoys legitimacy from the perspective of the international standardization system.

The second governance model represents a global partnership of regional SDOs, such as the 3GPP and OneM2M. The rules and processes of these SDOs strive to strike a balance between the interests of private actors ("balance of commercial stakeholders"). Stakeholders participate in these partnerships by virtue of their organizational membership in regional SDOs. Adherence to the requirements of commercial and regional balance is the legitimizing force behind their standards, immunizing them, at least in theory, from undue commercial influence. This type of SDO furthermore enjoys increased legitimacy from the perspective of commercial stakeholders, since the voting rights are typically allocated according to stakeholders' size and financial contribution to the SDO.[43]

In contrast to the two entity-based governance models, SDOs designed according to the third governance model represent associations of professionals rooted in the traditions of democracy ("democracy of experts"). Individuals participating in these SDOs typically follow the norms of conduct of their profession but may also participate through their affiliation and represent the interests of their employer. An example of such an SDO is the Standards Association of the Institute of the Electrical and Electronics Engineers (IEEE-SA). Standards developed in these SDOs are largely legitimized by their inclusive processes, which seek to provide equal opportunities for all members to voice their opinion, for instance, through the democratic election of SDO leadership. To enhance their legitimacy, such SDOs may also seek formal accreditation of their processes or standards by an organization in the highest hierarchical position, such as the American National Standards Institute (ANSI) or JTC1, which transposes public law requirements imposed on these national and global standards bodies to these private-sector associations.

The fourth and last model is even more centered on individuals and represents "informal groups of likeminded experts": IETF, which started as a loosely organized

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[40] This concept was adopted at the IEC meeting in London in 1906. J. Yates and C. N. Murphy, *Engineering Rules: Global Standard Setting since 1880* (2019).

[41] For instance, ISO is recognized in the TBT and SPS Agreements of the World Trade Organization.

[42] Note, however, that companies may also participate in ITU as sector members, but their rights and obligations slightly differ from Member States.

[43] See, by analogy, Annex 4 of ETSI Rules and Procedures (May 20, 2021) (ETSI provides secretariat to both 3GPP and OneM2M and its procedures are also transposed in these partnerships' operational frameworks).

group of internet researchers and to this day operates without formal membership requirements, is a vivid example of this governance model. Although some of these consortia have pledged the alignment of their processes with public law principles for standardization governance,[44] they usually do not seek formal recognition or accreditation at the higher hierarchical level.[45] Their legitimacy is exclusively derived from meritocracy and free participation of all interested individuals, regardless of their affiliation: more often than not, such SDOs would require individuals to refrain from representing the position of their employer as a vital requirement to the independence of the SDO.

14.3.2 *Integrity of SDO Processes of Different Governance Models*

The governance models discussed above generally demonstrate two different approaches to ICT standardization. Under the first approach, standardization decisions should reflect a consensus of those affected by the standard; standardization processes should therefore be open to the relevant stakeholders and seek a balance of the different stakeholder groups and assure sufficient representation of different types of interests. SDOs adhering to these principles may give greater weight to stakeholders with a larger stake in the standard, assess consensus within different categories of interests, and/or encourage participation of representatives of specific underrepresented interest categories. Under the second approach, standardization decisions should reflect a technical consensus among subject matter experts. SDOs operating following this approach seek to be open to any interested individual expert, expect their participants to take technical decisions on merit, and often discourage individuals to represent the interests of a particular stakeholder. Such approach is traditionally maintained in internet governance,[46] which is also illustrated by the IETF's requirement for experts to participate in the individual capacity rather than represent their employer.

While impartiality and independence of SDOs has gained attention in the recent scholarly and political discussions,[47] an element that has been neglected in these

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[44] See the IAB reply to the European ICT questionnaire, Impact assessment study on the "standardization package." Request for information from forums and consortiums, www.iab.org/wp-content/IAB-uploads/2011/03/2010-02-05-IAB-Response-Euro-ICT-Questionnaire.pdf; WTO TBT Standards Code criteria applied to W3C, (July 12, 2009), www.w3.org/2009/07wto-std-crit.html.

[45] J. Baron et al., Balance Requirements for Standards Development Organizations: A Historical, Legal and Institutional Assessment' (January 2021), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3806876.

[46] See P. J. Weiser, Internet Governance, Standard- Setting, and Self-Regulation (2001) 28 *Northern Kentucky Law Review* 822.

[47] See, for instance, Report on the 802.11ax dominance complaint (Investigation), (November 9, 2016), https://mentor.ieee.org/802.11/dcn/16/11-16-1519, which was covered by A. Harcourt, G. Christou, and S. Simpson, *Global Standard Setting in Internet Governance* (2020), as well as abovementioned discussion on DRMs approval in W3C and IEEE patent policy change.

debates is the interplay of different motives and incentives shaping individuals' conduct in SDO committees. Irrespective of governance models, stakeholders participate in SDO processes by sending individual employees to attend their meetings. Furthermore, since SDOs have limited staff, their administrative and management functions – including editors and working group chairs, as well as the members of appeals boards, policy committees, and other governance bodies – are filled by volunteers who are often affiliated with private companies. Hence, the impartiality of the standardization process depends on the decisions of individuals employed by organizations with direct stakes in the SDOs' decisions.

The individual dimension of SDO participation is quintessential, since it provides insights on decision-making within the standards body and its committees, revealing some fundamental accountability questions that are not always evident on the surface, including the following: who are the main decision-makers, how are they appointed, and what are their obligations towards the membership. The role of individuals is especially critical in a highly competitive environment, such as ICT standardization: experts sitting on the committees may wear different hats and have contradictory commitments to their employer, peers, or profession. Against this backdrop, understanding how individuals are selected to SDO leadership is an important facet through which the integrity and independence of different SDO governance models can be examined.

14.4 FORMAL RULES OF SDO LEADERSHIP SELECTION

By far the most important and common leadership function in SDOs is the role of a working group chair. Individuals holding these positions have weighty responsibility but also considerable power: they coordinate the work of the respective working group, serve as the first stage of appeal or investigation processes into the breaches of SDOs' procedural rules, and make pivotal decisions such as whether consensus has been achieved or the voting should be conducted. In some cases, chairs may delay or even stall their working groups' discussion.[48] A position of a chair may thus be highly advantageous for companies actively participating in standards development and exert a significant influence on the outcome of standardization decisions; at the same time, since chairs serve as tie-breakers, they are critical to balancing the interests and ensuring impartiality of SDO processes.[49] Furthermore, pursuant to the established jurisprudence, decisions of chairs are attributable to an SDO and may thus entail legal responsibility for the organization,[50] which will also affect SDO membership.

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[48] See examples in Harcourt et al., *supra* note 48.
[49] Marpet, *supra* note 35, discussing chairs' obligation to balance the rights of members and ability of the group to perform its function.
[50] See the relevant jurisprudence, *supra* note 36.

Each SDO has its own rules for election or appointment of its leadership that are entrenched in historical traditions and have evolved due to the membership expansion and the emerging jurisprudence.[51] This section reviews the rules of the four prominent ICT SDOs that apply to the conduct of working groups' chairs, including their appointment, tenure, and resignation, in the light of the overall institutional rules and traditions of these organizations.

14.4.1 *ITU*

Formally, holding leadership positions in ITU Study Groups[52] does not confer the individuals with any influence over standards development. This however contradicts the fact that chairs are tasked with maintaining the order in their committees, authorizing the voting as a "last resort" where consensus by the means of "sound out" cannot be achieved, ruling on motions, and suspending meetings.[53] While seeking the balance is not explicitly listed as a chair's responsibility, they are required to protect the rights of each member's representative.

Officials for ITU Study Groups, including chairs and vice-chairs, are appointed the Sector Assembly (e.g., the WTSA for the ITU Standardization Sector). Each member state's and Sector member's delegation nominates their candidate(s) for chairs and vice-chairs by consensus; the list of nominees, including their resumes and qualifications, is then circulated among the Sector membership and is made available on the ITU website.[54] When appointing the officials, the Sector Assembly should take into account individuals' personal competences, equitable geographical distribution, and the need to promote more efficient participation by the developing countries;[55] the individuals' professional knowledge and expertise, managerial skills, candidates' and their administration's commitment to fulfill the duties of the Study Group officials, as well as individual's prior experiences as rapporteurs or editors and continuous participation in Study or Advisory groups, also counts.[56] Members are discouraged from nominating candidates who failed to participate in at least half of all meetings in the prior study period. In case the nominees' qualifications are equal, preference is given to members with lowest number of chairs. Members cannot nominate candidates for chairs and vice-chairs for the same Study Group to

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[51] An example is the requirement for chairs to follow the SDOs' antitrust training, e.g., https://standards.ieee.org/faqs/ldrship.html.

[52] Those are ITU committees where technical work is carried out.

[53] ITU General Rules on Conferences, Assemblies and Meetings (2019), Articles 59–61.

[54] In 2020, China had a long list of candidates for chairmen and vice-chairmen for the WTSA-20, see www.itu.int/en/ITU-T/wtsa20/candidates/Pages/ms.aspx.

[55] ITU Convention (2018) No 189 and Article 20.

[56] See ITU-T Resolution 35 on Appointment and maximum term of office for chairmen and vice chairmen of study groups of the Telecommunication Standardization Sector and of the Telecommunication Standardization Advisory Group (Hammamet, 2016). See also the letter from Chaesub Lee (February 4, 2021), www.itu.int/md/T17-TSB-CIR-0202/en.

safeguard geographical distribution; moreover, the appointment of vice-chairs is limited to three candidates from each region, but the ultimate number of vice-chairs appointed per Study Group depends on equitable distribution as well as the workload.

To allow introducing new ideas on a periodic basis and to provide opportunities to different States, Study Group chairs are appointed for a limited time and with a maximum tenure of two terms.[57] For the sake of continuity, this term does not count for another appointment, meaning that a Study Group's chairman can be appointed as the group's vice-chairman and vice-versa.[58] However, no individual can hold more than one vice chairmanship.

14.4.2 *3GPP*

Working Group chairs of 3GPP are responsible for the management of their committees, and their compliance with the prescribed processes, and are required to maintain impartiality and act in the interests of 3GPP when performing their leadership tasks.[59] Working Group officials are tasked with formulating the questions put forward for voting as well as with maintaining impartiality in the Working Group.[60] Furthermore, chairs determine when consensus is reached and may impose voting or temporary arrangements in case consensus is not achieved.[61] At the beginning of each meeting, the chair is required to make a statement of antitrust compliance and call for IPRs;[62] for a short period of time in 2019, the chair was also required to make a statement of compliance with the US EARs.[63]

The Working Group officials are elected by the members of the respective Working Group every two years.[64] Candidates for (vice-)chairmanship should provide a letter of support from the 3GPP member, which should also assure the candidate's compliance with antitrust rules if elected for the office.[65] In an endeavor to maintain balance, a Working Group's chair and vice-chair, as well as their successive officials, cannot be from the same region, organizations, partner, or group of companies, unless no other individual is available to hold the office.[66] If more

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[57] See ITU-T Resolution 35 and Resolution 208 (Dubai, 2018) on the Appointment and maximum term of office for chairmen and vice-chairmen of Sector advisory groups, study groups and other groups.
[58] Ibid.
[59] 3GPP Working Procedures (April 29, 2021), Article 23.
[60] Ibid., Articles 23 and 25.
[61] Ibid., Articles 19 and 25.
[62] Statement of Antitrust Compliance, www.3gpp.org/about-3gpp/legal-matters/21-3gpp-calendar/1616-statement-of-antitrust-compliance.
[63] Statement regarding Engagement with Companies Added to the U.S. Export Administration Regulation (EAR) Entity List in 3GPP Activities, www.3gpp.org/about-3gpp/legal-matters.
[64] 3GPP Working Procedures (April 29, 2021), Article 22.
[65] Ibid., Article 22.1 and 22.2.
[66] Ibid., Article 14.

than one candidate is nominated for the chair position, the election of Working Groups' officials occurs through secret balloting, with a threshold of 71 percent of Working Groups members voting and present; if the processes is unsuccessful, it is followed by a second ballot between the candidates obtaining the highest amount of votes.[67] Individuals can be reelected as Working Group chairs for the second term, and exceptionally, their tenure in the office can last even longer; there are no restrictions for the election of chairs whose tenure is due to expire as vice-chairs and vice-versa.[68]

An incumbent chairman or vice-chairman who changes their affiliation, for instance, due to taking up new employment, is required to present a new letter of support from their new employer. If affiliation is changed due to the individual's hiring by another company, and not their company's merger or acquisition, the Working Group should also agree by consensus that the individual can remain in their role as a (vice-)chair.[69] When a chair is believed not to effectively perform their duties, their dismissal can be requested by 30 percent of a Working Group in a secret ballot, with 71 percent of votes considered as recommending the dismissal. Furthermore, if a Working Group member doubts the chair's impartiality and believes the chair does not act in the interest of 3GPP, they should object to the chair's decision and request that the objection is recorded, prior to taking the issue to the PCG.[70] (Vice-)chairs can be dismissed through a secret vote of the Working Groups when they fail to effectively perform their duties.[71]

14.4.3 *IEEE-SA*

IEEE-SA Working Group chairs provide leadership and guidance and serve as a contact point for questions or comments regarding standardization activity. Their main task is to move the Working Group forward while ensuring that every voice has been heard and that the rules and procedures of the working groups are respected.[72] In carrying out their activities, chairs need to be objective, refrain from making motions and strive to balance the interests in their Working Group. The chair is also in power to determine the Working Group's participants and is (almost) the only official who holds control over distributing the draft standard.[73]

IEEE Study Groups officials, including chairs and mentors, are appointed by the Sponsor committee – a body that provides oversight for the working groups'

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[67] Ibid., Article 28.
[68] Ibid., Article 22.
[69] Ibid.
[70] Ibid., Article 29.
[71] Ibid., Article 24.
[72] Managing the Working Group, https://standards.ieee.org/develop/mobilizing-working-group/managewg.html.
[73] Sharing Draft IEEE Standards, https://standards.ieee.org/faqs/copyrights/working-group-and-activity-chairs.html#5-1.

activities. Once assigned, the Study Group chair can further appoint the secretary who is charged with record keeping and contacting Study Group members; yet it remains the task of the chair to distribute the call for participation in a Study Group.[74] IEEE Working Groups chairs are either appointed by a standards committee or elected by the respective Working Group; in the latter case, the official should be confirmed by the sponsor.[75] Procedures for officials' election, as well as the definition of what constitutes a consensus, are further specified in the Working Group's charters; for instance, chairs of the IEEE-SA 802.11 Working Group, responsible for the development of WLAN specifications, including Wi-Fi, are elected biannually from the nominated individuals, following a debate in the biannual working group, upon receiving a simple majority of cast votes.[76]

While there is no specification of the qualities and skills crucial for the chairs (presumably because those are left to Study and Working groups), it is required that the Working Groups' chairs hold the membership of both IEEE and IEEE-SA, which implies that by the virtue of individual IEEE membership, they should be familiar to and with the SDO. There is no overarching requirement for a maximum term of office: chairs may either serve limited terms or undergo a regular vote confirmation.[77]

14.4.4 *IETF*

IETF Working Group chairs are the formal contact point of their Working Group and IETF governance bodies and other SDOs. Chairs preside over the Working Group meetings, manage its activities and publications, accept or reject participants' input, and decide whether a draft recommendation is to be published as an official Working Group draft;[78] they also moderate mailing lists, prepare face-to-face sessions, and serve as a first stage of conflict resolution. They have a wide discretion in administering Working Group activities and may also make decisions on behalf of their Working Group, where they may be assisted by the area directors – individuals in charge of a particular domain of IETF activities.[79] Chairs are also responsible for deciding when and whether consensus between the group members is reached,[80] which can be particularly challenging in the absence of formal voting and when most of the meetings occur through the mailing list. Crucially, chairs should

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[74] IEEE-SA Study Group Guidelines, https://standards.ieee.org/content/dam/ieee-standards/stand ards/web/documents/other/corpchan/studygrp.pdf.

[75] How are Working Groups Governed?, https://standards.ieee.org/develop/mobilizing-working-group/governedwg.html.

[76] IEEE 802.11 Wireless Local Area Networks Operations Manual (July 13, 2018) Article 3.4.

[77] See How are Working Groups Governed?, *supra* note 76.

[78] See The Tao of IETF (November 8, 2018), www.ietf.org/about/participate/tao/.

[79] BCP 25, IETF Working Group Guidelines and Procedures (September 1998), https://tools.ietf.org/html/bcp25.

[80] See Working Groups, www.ietf.org/wg/.

balance "progress and fairness" and ensure that the Working Groups move forward while the process remains fair and open.[81]

IETF Working Group chairs are assigned by the area directors who in turn are selected by the nominating committee (NomCom), whose members are randomly selected from a pool of volunteers and approved by the Internet Architecture Board (IAB).[82] While both technical and communication skills of a chair candidate matter, individuals who have been around in IETF for a long time and have been actively participating in its meetings are more likely to get appointed as chairs, especially if they gained "favorable prominence"[83] by having previously contributed to the documents or volunteered to review them.

IETF chairs' neutrality and impartiality has been challenged on a number of occasions, including allegations of abuse of power and breaching fairness and neutrality of IETF processes by favoring solutions preferred by the chairs' affiliation.[84] Interestingly, at least in these instances, the IETF appeal bodies did not find any evidence of conflict of interest stemming from the individuals' affiliation,[85] illustrating two important elements of IETF leadership: first, the high level of trust in independent and unbiased judgment of chairs and, second, the chairs' wide prerogative for moving forward the discussions in the working groups.

14.4.5 *Takeaways from Analyzing the Rules for Leadership Appointment*

Even though the four studied SDOs are rooted in different historical traditions, we can observe some similarities and differences in their rules for leadership appointment. The distinction between entity-based and individual-based governance models is particularly striking: as illustrated with the examples of ITU and 3GPP, entity-based SDOs devote particular attention to the balance in their leadership composition with such aspects as regional and commercial diversity and non-transferability of chairs' positions.[86] Likewise, the employers' formal and explicit support plays a significant role when selecting or appointing the chairs in these two organizations. Contrarily, the rules for leadership appointment in individual-based

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[81] The Tao of IETF, Article 4.1.

[82] BCP 25.

[83] RFC 4144, How to Gain Prominence and Influence in Standards Organizations (September 2005), https://tools.ietf.org/html/rfc4144.

[84] See www6.ietf.org/iesg/appeal/anderson-2007-12-26.txt; www6.ietf.org/iesg/appeal/gellens-2007-06-22.pdf; and https://www6.ietf.org/iesg/appeal/masotta-2013-11-14.txt.

[85] See www6.ietf.org/iesg/appeal/response-to-anderson-2007-12-26.txt; https://www6.ietf.org/iesg/appeal/gellens- 2007-06-22.pdf.

[86] That said, possible theoretical claims that the requirement of balance in SDO leadership obviate regional dominance do not always find confirmation in the data on SDO leadership: at least in case of 3GPP, being an affiliate of an EU company appears to increase an individual's chances to be selected to the chair position, casting doubts about the practical effectiveness of this requirement. See Baron and Kanevskaia, *supra* note 19.

SDOs such as IEEE and IETF rely on the culture of meritocracy, rather than on balance of interests, and do not require any type of support from the officials' employers or affiliations.

At the same time, surveying procedural rules demonstrates the importance of experience and expertise in all four SDOs. This is apparent from the conditions that candidate-chairs have to fulfill regarding, for example, meeting attendance, knowledge and experience in the organization, and compliance with SDOs' antitrust policies. In both entity and individual-based organizations, chairs are always required to participate in an individual capacity and have a fiduciary duty to the SDO (although admittedly, whether or not the chairs indeed respect fiduciary duty is difficult to verify).

14.5 LEGAL AND INSTITUTIONAL DIMENSIONS OF SDO LEADERSHIP

The institutional analysis suggests different approaches to legitimacy of SDO leadership, which correspond to the contrast between "commercial balance" and "meritocracy" of entity- and individual-based SDOs respectively. Yet, despite the identified procedural differences, including such nuances as opportunities for reelection and the duration of tenure, both types of SDOs approach leadership in a similar way in the sense that they have certain behavioral and reputational expectations for individuals holding leadership positions, requiring them to set their personal preferences, or employers' agenda, aside in the interest of the SDO. These nuances undoubtedly contribute to the checks and balances that different SDO models have in place, depending on these SDOs' governance structure, culture, and membership.

The fact that the requirements of expertise and experience appear to be the main determinants for leadership appointments, regardless the SDO's institutional setup, demonstrates a strong culture of individual independence and meritocracy. The "community of professionals" mobilized through this culture functions outside the SDOs' organizational hierarchy or State-driven processes, evidencing the phenomenon of "voluntary economic activism."[87]

While these observations do not allow us to conclude which SDO type is better equipped in dealing with the situation of distress, they help in reflecting on the SDOs adaptive capacities. They also indicate that despite the presence of checks and balances in their governance models, SDOs are not immune to crises caused by the capture of their processes. To strengthen SDO resilience, revisiting leadership rules in terms of neutrality and independence is in order.

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[87] See, in this regard, the definition of P. Delimatsis, "The Resilience of Private Authority in Times of Crisis" in this volume (Chapter 1).

Furthermore, and without any pretense of exhaustiveness, our descriptive analysis of SDO leadership rules, interpreted through the previous empirical studies on participation in SDOs suggesting the increase of participation of Chinese companies in ITU[88] and the unchallenged supremacy of Western companies in 3GPP, IEEE, and IETF,[89] allows us to make some observations regarding the integrity of different SDO governance models but also their relevance for global standardization activities. It is commonly assumed that standards developed through intergovernmental bodies, such as ITU, enjoy increased legitimacy, which also facilitates their global dissemination. However, the role of ITU appears to be limited for the industry, and Western countries where standardization traditions are entrenched in the private sector prefer to streamline their standardization efforts in the industry-led SDOs rather than intergovernmental ITU.[90] Conversely, ITU is a preferred standards development platform for standardization newcomers and, in particular, Chinese companies, which arguably use ITU processes as an opportunity to promote their technologies in non-Western countries: for instance, ITU standards are adopted as regulatory policy in Africa and Asia,[91] while Huawei's technologies are actively used in the development of smart cities on the African continent.[92]

It is not entirely clear what served as a catalyst for this fragmentation. On the one hand, the global openness of ITU may have been the reason for Western States to resort to private organizations whose cultural traditions they are more comfortable with. On the other hand, the preference of Western industry for institutions with particular properties and their lack of interest in ITU may have created openings for emerging standardization stakeholders, which were quick to fill the vacant spots with their own standardization efforts. Most likely, these two phenomena are jointly determined. Regardless of their source, they indicate a serious lack of "openness" in terms of inclusiveness and geographical representativeness in SDO leadership.

Two perspectives emerge from this suggestion. The first one is the perspective of Western stakeholders, characterized by the growing distrust in ITU and concerns that its greater openness may allow for strategic national interests to prevail over commercial ones. These concerns go beyond ITU and are particularly relevant for the "national representation" governance model, since equal voting rights per national committee may not always correspond to the level of contribution to, or use of, their standards. Indeed, equal voting rights seem to facilitate achieving fairness and impartiality; in reality, however, precisely for this reason, this type of SDO is also extremely prone to lobbying and "packing the vote" strategies by the

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[88] Cantero Gamito, *supra* note 21.

[89] Baron and Kanevskaia, *supra* note 19.

[90] Hoffmann et al., *supra* note 30, at 246, mentioning the recent drop of industry membership in ITU-T.

[91] Cantero Gamito, *supra* note 20, at 2.

[92] Gross et al., *supra* note 34.

stronger stakeholders. Leadership of this type of SDO should be subjected to additional safeguards that ensure not only its diversity but also integrity and impartiality.

The second perspective is the one of non-Western stakeholders, and in particular Chinese actors whose participation in ICT standardization has surged only recently. From this potential viewpoint, industry-driven SDOs such as 3GPP, IEEE, and IETF exhibit bias toward Western stakeholders and a significant lack of diversity and global interest representation in their leadership. As this lack of diversity may render Western-driven SDOs increasingly less attractive for Asian stakeholders, these SDOs may also lose important technical contributions, which in turn may also affect standards implementation on the non-Western markets; the latter is especially worrisome given the current climate of techno-nationalism in countries such as China. In due course, this development may not only contribute to further fragmentation of ICT standards but also put into question the legitimacy of the global standardization ecosystem as well as these SDOs role as global standard-setters.

14.6 CONCLUSION

Huawei's increasing influence in the global technological sector has generated various scholarly and policy discussions. With regard to standards development, the narrative shared by some Western policymakers and commercial actors is that through acquiring leadership positions in SDOs, Chinese stakeholders, particularly Huawei, may pave the way for SDO processes to become partisan towards China's commercial and political strategic interests. However persistent, these concerns should be viewed in the light of the empirical evidence of Chinese and Huawei's participation in SDOs and their representation in the critical positions in these institutions.

In this regard, the empirically observed pattern demonstrated that, currently, SDO leadership is still largely dominated by Western stakeholders. At the same time, the meeting attendance by individuals affiliated with Chinese stakeholders, and in particular Huawei, has been dramatically increasing. Hence, while concerns of Chinese stakeholders taking over SDO leadership are still premature, there is undisputable evidence of China's and Huawei's strategy to increase their presence in these SDOs. The question is then whether SDO processes can be trusted to address the arising concerns of a single group of stakeholders controlling their decision-making and whether SDO institutional framework will hold to the standards of neutrality and impartiality.

Our contribution addresses this question by discussing different SDO governance models, focusing in particular on the roles of individuals holding critical positions in four prominent SDOs. We demonstrate that, despite the strong institutional traditions of meritocracy and neutrality and the existent checks and balances of the different institutional frameworks, SDO leadership relies on the system where

private interests are actively pursued through the incentives of individuals holding critical positions and is thus inherently fragile. To trust this institutional setup, we need to carefully consider how individuals that represent these institutions are selected and which institutional mechanisms are available to constrain their power over SDO decision-making. Despite the common, and rather optimistic belief, neutrality in standardization processes should not be taken for granted: further institutional and empirical analyses are at order to assess the resilience of SDOs to different types of crises.