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POLICY INSIGHTS

Who drives the international standardisation of telecommunication and digitalisation? Introducing a new data set

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Abstract

Reinforced by the technological decoupling and the related battle for technological supremacy between the United States and China, telecommunication technology has become increasingly politicised. As the functioning of global telecommunication technology relies on interoperability and compatibility, government and private actors have strong incentives to shape the underlying standards in their economic and political interests. The International Telecommunication Union (ITU) and its Members play a central role in setting these standards for future telecommunication technology. Despite the ITU's importance in this field, relatively little is known about the organisation's work on standardisation and the actors behind it. This Policy Insight introduces a new data set on the involvement of over 800 government and private actors and their almost 50,000 contributions to ITU standardisation processes between 2000 and 2022. A descriptive analysis of the data set illustrates that particularly Chinese actors—Huawei, ZTE, China Mobile, China Unicom and China Telecom—have been actively driving the ITU's standardisation processes in the areas of transport, access and home but also future networks and cloud. The data set introduced here is envisaged as a source which allows researchers to study the reasons and implications for certain actors' involvement in the international standardisation of telecommunication and digitalisation.

NOT A STANDARD ELECTION

It rarely is the case that the election of a Secretary-General of a specialised United Nations (UN) agency attracts the attention of the international press. Not so with the International Telecommunication Union (ITU), the UN's standardisation agency for information and communication technologies (ICT), which elected Doreen Bogdan-Martin on 29 September 2022 to be the first woman to lead the ITU in its 157-year history. The standards developed by the ITU and its Members affect almost every part of digital life, ranging from telephone and mobile calls to internet access and data transport as well as emerging technologies such as intelligent transport, wearable devices, augmented reality, and the Internet of Things. While it might be commendable that a woman is taking over the helm of the ITU for the first time, this is not what got the international press interested in the first place. Rather, it was the fact that Doreen Bogdan-Martin, who is from the United States (US), was running against Rashid Ismailov, who is from the Russian Federation. Only days before the vote, the Financial Times (2022) titled that the 'election [is] set to decide who governs the internet', while The Economist (2022a) referred to '[a]n election that could make the global internet safer for autocrats'. The Brookings Institution (2022) called it '[t]he most important election you never heard of', arguably in reference

to an earlier commentary by the Center for Strategic and International Studies (2020) which calls the ITU '[t]he most important UN agency you have never heard of'.

The election was politically important enough for US Secretary of State Blinken to post an official endorsement video (Department of State, 2022) and for US President Biden to issue a statement 1 week prior to the vote to '[…] strongly support Doreen Bogdan-Martin for the next Secretary-General of the International Telecommunication Union. [The statement points out that] Ms. Bogdan-Martin possesses the integrity, experience, and vision necessary to transform the digital landscape' (The White House, 2022a). While the Russian invasion of Ukraine may have had an effect on the vote (Atlantic Council, 2022; Politico, 2022a), other geopolitical tensions are likely to have also played a role in the politicisation of the recent election of the ITU's Secretary-General.

Indeed, many observers considered this election to go far beyond the appointment of a new leading bureaucrat. Instead, the vote was seen as a directional decision between an internet that is run by a decentralised, bottom-up approach involving a broad range of stakeholders or a centralised, top-down system in which governments hold most powers (Financial Times, 2022; Politico, 2022a; The Economist, 2022a). In contrast to most expectations, the vote was rather clear: Of the 172 ITU Member States that were present at the organisation's Plenipotentiary Conference in Bucharest, Romania, 139 (81%) were in favour of Doreen Bogdan-Martin of the US and 25 (15%) in favour of Rashid Ismailov of the Russian Federation (International Telecommunication Union, 2022a). Doreen Bogdan-Martin began her 4-year term on 1 January 2023 and took over from Houlin Zhao from China who headed the ITU since 1 January 2015.[1]

Without a doubt, a Secretary-General has the ability to steer the overall direction of an organisation such as the ITU. Arguably, however, it is the day-to-day technical work that actually influences the design and the content of the standards that govern such a large part of digital life. While politicians and the international press appear to have realised the economic and political importance of the ITU and its standards, little is known about the actors that shape the content of these standards. This *Policy Insight* aims to shed some light on this in two ways. First, this *Policy Insight* makes available a new data set on the contributions of more than 800 government and private actors to the standardisation processes of the ITU over the period from 2000 to 2022. Second, this *Policy Insight* provides a brief descriptive discussion of this data set and highlights the actors that drive the international standardisation of telecommunication and digitalisation in the ITU.

Before doing so, however, it is important to ask why ITU standards are so important to governments and companies? Why do these actors have an interest in influencing the design and the content of these standards? And how can actors assert their influence?

To begin with, it is important to recognise that regulations, in general, but also in telecommunication more specifically, vary across countries. This regulatory heterogeneity presents a challenge to internationally operating companies which need to adapt their products to different markets. As a result, companies face information costs (related to the time and effort spent on identifying specific rules and regulations applicable to different countries and markets), specification costs (related to tailoring their production processes to different country-specific rules and regulations) and compliance costs (related to proving compliance with the applicable country-specific rules and regulations) (Karttunen, 2020). International standards can help companies to reduce these costs and enable them to achieve larger economies of scale. However, the compliance with international standards may still result in adjustment costs for some actors and in conflicts of interest of the distributional consequences of these costs. That is, every company has an economic incentive to ensure that the technical specifications of an international standard are as closely aligned with the company's technical preferences as possible. This would drive down the company's adjustment costs while driving up competitors' adjustment costs, resulting in a competitive advantage. National governments, which represent their national industries and companies, have similar economic incentives. These economic incentives to influence the design and the content of standards are particularly strong if the compliance with international standards becomes mandatory when they are incorporated into national laws—as is often the case with ITU standards.[2]

From a political point of view, governments have strong incentives to design and commit only to international standards which are aligned with their own regulatory philosophy. At the aforementioned ITU Plenipotentiary Conference in Bucharest, Romania, for example, the European Union (EU) representative encouraged the ITU and its Members 'to develop international telecommunications/ICTs standards that are consistent with existing international frameworks on human rights and fundamental freedoms' (European External Action Service, 2022). And indeed, the link between digital standards and human rights is becoming increasingly important, as also illustrated by a recent speech of the UN High Commissioner for Human Rights at the World Standards Cooperation[3] (Office of the High Commissioner for Human Rights, 2023).[4] This may be of particular importance for international standards on biometrics, surveillance systems and similar topics.

To summarise, government and private actors have strong incentives to comply with international standards. However, actors may also have considerably

divergent views on the design and the specifics of these international standards. In a game theoretical sense this set-up is akin to a "Battle of Sexes" in which players have an incentive to coordinate but due to distributional conflicts disagree on the outcome of coordination (Abbott & Snidal, 2001). To ensure that they are on the winning side of these distributional conflicts, actors have strong incentives to actively participate and contribute to the standardisation processes. As Büthe and Mattli (2010, p. 466), two leading scholars on the politics of international standardisation, state: 'To put it bluntly: you have to play to win. Those who actively participate in the technical work – directly or indirectly – have many more opportunities to shape the scope and the specific content of the standard than those who only comment at the enquiry stage or later. Effective participation in turn should require early and good information, so as to allow stakeholders to determine the implications of a proposed new standard for their products […] and to influence the technical specification accordingly'.

This *Policy Insight* takes a close look at the actors who most actively contribute to the standardisation processes of the ITU. The next section proceeds with a short discussion on telecommunication technology and its growing importance in the recent geopolitical landscape. As part of this, the ITU—an organisation which, despite its importance, has so far received relatively little scholarly attention—is briefly introduced. The principal focus and contribution of this *Policy Insight*, however, is the introduction of a new data set on government and private actors' almost 50,000 contributions to the ITU's standardisation work over the past 22 years. After highlighting the government and private actors which most actively drive the ITU's standardisation work, this *Policy Insight* concludes by pointing towards potential research questions that may be addressed using the data set introduced here.

TELECOMMUNICATION TECHNOLOGY AND GEOPOLITICS

Over the past years, technology has become a highly contentious topic in geopolitics. In particular, the technological decoupling and the related battle for technological supremacy between the US and China, which started under US President Trump but continues under US President Biden, has been moving the topic further up the international political agenda and the strategic policy debate (Faaborg-Andersen & Temes, 2022; The Economist, 2022b).[5] Much of the ongoing controversy on technology started around telecommunication networks and, more precisely, the expansion of the fifth generation (5G) mobile network—commonly regarded as a prerequisite for the development of future technologies such as the Internet of Things. As Inkster (2020) notes, the '[d]omination of the global 5G market has become a key battleground in a wider geo-political contest between the USA and China […]' (p. 159).

In May 2019, US President Trump signed an executive order which banned US companies from using telecommunication equipment made by companies posing a national security risk (Federal Register, 2019a). Within days, the US Department of Commerce added the Chinese telecommunication company Huawei to its 'Entity List' of companies prohibited from buying parts and components from US companies without the US government's approval (Federal Register, 2019b). In June 2020, the US Federal Communications Commission (FCC) designated Huawei and ZTE (another Chinese telecommunication company) as national security threats (Federal Communications Commission, 2020). In October 2021, the FCC revoked China Telecom's licence to provide telecommunication services in the US (Federal Communications Commission, 2021) and in January 2022 the FCC followed suit with China Unicom (Federal Communications Commission, 2022). Together with China Mobile, China Telecom and China Unicom present China's 'big three'—all three have been delisted from the New York Stock Exchange (Financial Times, 2021). In the latest round of the intensifying battle for global technology supremacy, US President Biden has signed the CHIPS and Science Act which explicitly aims to 'lower costs, create jobs, strengthen supply chains, and counter China' (Bloomberg, 2022; The White House, 2022b). Together with the EU, the US has also recently established the Technology and Trade Council (TTC), 'a transatlantic forum fostering cooperation on trade- and technology-related issues, based on shared democratic values' (European Commission, 2022). The 10 working groups of the TTC cover a wide range of topics including technology standards, climate and clean technology, secure supply chains, information and communication technology and services security and competitiveness, data governance and technology platforms, the misuse of technology threatening security and human rights, cooperation on export controls of dual-use items, investment screening cooperation, promoting access to and use of digital technologies, and global trade challenges. While the TTC rarely mentions China explicitly, it is widely understood as a geopolitical vehicle with which the US seeks to build a Western alliance against China's technological and economic might (European Council on Foreign Relations, 2022).

Many of the standards which allow telecommunication technology to function seamlessly are developed by the ITU, based in Geneva, Switzerland. This is also the case for semiconductors and 5G, for which the ITU initiated the development of related standards more than 10 years ago in early 2012. Despite the ITU's important role in shaping today's and tomorrow's telecommunication technology, the organisation has so

far received relatively little attention in the political science literature. Indeed, as previously mentioned, '[t]he International Telecommunication Union [is] the most important UN agency you have never heard of' (Center for Strategic and International Studies, 2020). Before outlining some of the academic contributions of the ITU, the next section will briefly introduce the organisation.

THE INTERNATIONAL TELECOMMUNICATION UNION

The ITU was founded in 1865, became an UN agency in 1947, and has a current membership of 193 countries (Member States) and of around 800 companies, universities, research institutes and international and regional organisations (Sector Members) (International Telecommunication Union, 2022b). Sector Members may participate in the standardisation work, have access to all relevant standardisation documents and have a say in the approval procedure for new standards. As will be discussed in further detail below, the ITU's standardisation work is organised in 11 Study Groups (SG) which develop standards[6] without which one would not be able to access the internet, make phone calls or drive the autonomous cars of the future. Currently, more than 4000 ITU standards are in force. These standards are developed through a 5-step development workflow, followed by a 7-step approval workflow.[7]

The standard development workflow is initiated by ITU Members submitting a so-called Question to the relevant SG. Questions are the basic project unit and address technical studies in a particular area of telecommunication standardisation. For example, in the study period 2017–2021,[8] SG 13 worked on 'Future Networks: Innovative service scenarios, including environmental and socio economical aspects' (Question 1) and 'Next-generation Network (NGN) evolution with innovative technologies including software-defined networking (SDN) and network function virtualization (NFV)' (Question 2), among others.

To work on these questions, and ultimately develop the associated standards, Sector Members and Member States submit so-called Contributions. These Contributions can take the form of a draft standard or a proposal for a change of an existing standard. The ITU itself describes this workflow as "contribution-driven". More precisely, the ITU states that '[b]y making inputs to the process, it is possible to shape future standards. The whole standardization process is "contribution-driven", as these form the basis for virtually all [standards].' (International Telecommunication Union, 2023b) In other words, actors can submit Contributions to influence the specifications of future standards in their technology but also economic and/or political interests. Once the work on a Question is sufficiently mature and a draft standard is prepared, the approval workflow begins. After approval, the ITU publishes the standard. The conformance with ITU standards is voluntary in nature. However, as previously mentioned, national laws or regulations may refer to ITU standards and mandate conformance. The fact that ITU standards may be incorporated into national laws and regulations is an additional incentive for actors to ensure that the standards are developed in their economic and/or political interests.

Since 2015, Houlin Zhao from China led the ITU as Secretary-General—not always without criticism. His explicit support of the 'Belt and Road Initiative' (China Daily, 2019; ITU, 2017; The Economist, 2022b) and the perceived support of Huawei (Politico, 2022b; Reuters, 2019), for example caused concern in the US and its Western allies. Another controversy that fell into Houlin Zhao's tenure centred around the so-called "New IP", where "IP" stands for "internet protocol". Proposed by Huawei, China Mobile, and China Unicom, in cooperation with China's Ministry of Industry and Information Technology, the "New IP, Shaping Future Network" initiative was launched at the ITU on 23 September 2019 (International Telecommunication Union, 2019). Simply put, the New IP is argued to be designed in a way that would increase governments' control over citizens' internet use (Financial Times, 2020).[9]

In terms of funding, the ITU largely relies on its Member States and, in particular, on its top contributors (in descending order): the US, Japan, Germany, France, China, Italy, the Russian Federation, Australia, Saudi Arabia, Brazil, Canada, India, South Korea, Switzerland, and the United Kingdom (International Telecommunication Union, 2022c).

Within the world of international standardisation, the ITU's position has evolved over the past years. In relation to the rules of the World Trade Organisation (WTO), for instance the ITU—along with the International Organisation for Standardization (ISO) and the International Electrotechnical Commission (IEC)—continues to be a particularly relevant organisation for the governance of technical barriers to trade (World Trade Organisation, 2023). In the broader area of digital technology, however, other actors such as the Internet Corporation for Assigned Names and Numbers (ICANN), the Internet Engineering Task Force (IETF), the Internet Governance Forum (ITF), the United Nations Commission on International Trade Law (UNCITRAL) and the World Summit on the Information Society (WSIS) have been becoming increasingly influential—leading to a 'balkanised' standardisation paradigm in this sector (Liu, 2014).[10] The work of these institutions partly overlaps but is largely complementary. The ITU focuses on interoperable telecom specifications including architecture, services, protocols, and addressing/numbering plans. ISO's work relates to ICT architecture, services, and protocols including application layer protocols, while

IEC focuses on electrotechnical standards such as connectors and electrical safety. The IETF works on all internet-related specifications such as protocols, generic applications, and addressing rules, while the Institute of Electrical and Electronics Engineers (IEEE) focuses on electrical and electronics technologies (European Telecommunications Standards Institute, 2021).[11]

LITERATURE

Despite the ITU's importance for the global digital economy, and arguably its relevance for geopolitics, the organisation has so far received relatively little scholarly attention. The edited volume by Balbi and Fickers (2020) presents a recent exemption as the book's contributors assess the organisation's long history. Other recent contributions, such as those by Hoffmann et al. (2020), Baron and Kanevskaia (2021), Diplo and KAS (2021) and de La Bruyère (2022) focus specifically on the role of China in the ITU and other standardisation organisations in the digital area. However, so far, there exists no comprehensive data set that allows for the systemic analysis of the ITU's standardisation work and the actors behind it.

To a certain extent, the sparse literature is characteristic of the study of international standardisation organisations. The standards of ISO, for instance, affect almost every part of life, ranging from quality management and information security management to occupational health and safety and social responsibility. Yet, with a few exceptions (Büthe & Mattli, 2011; Klotz, 2021; Lim & Prakash, 2018; Murphy & Yates, 2009), there is relatively little scholarly work on ISO and the actors driving standardisation. The same can be said about the Codex Alimentarius, a standardisation organisation that governs a long list of food safety topics including the minimum amount of cocoa in chocolate or the maximum residue limits of pesticides in food. Beyond the Contributions by Masson-Matthee (2007), Clapp and Fuchs (2009), Büthe and Harris (2011) and Klotz (2021), however, little is known about the actors that drive the standardisation work at the Codex Alimentarius.

Understanding the actors in standardisation is important, however, not least because the actors themselves have certainly recognised the importance of international standardisation. In his book on The Digital Silk Road, Hillmann (2021, p. 14) records that '[…] Chinese officials have long said that third-rate countries build things, second-rate countries design things, and first-rate countries set standards'. The rationale for strategically influencing ITU standards is particularly clear: By definition, telecommunication technology relies on interoperability and compatibility. Whoever sets the standards upon which this interoperability and compatibility is based has '[…] the keys to the future of global communications with all the economic and geo-political advantages that would confer' (Inkster, 2020, p. 9). And indeed, as the ITU's outgoing Deputy Secretary-General recently told Politico, 'everybody is trying to advance the technology for their own interests' (Politico, 2022c).

The facilitate the study of the international standardisation of telecommunication and digitalisation, the next section introduces the new dataset that becomes available with this *Policy Insight*.

EXPLORING THE DATA SET

In contrast to some of the contributions outlined above, this *Policy Insight* does not a priori focus on one specific country (Member State) or company (Sector Member). Rather, this *Policy Insight* simply addresses the question of who drives international standardisation in telecommunication and digitalisation and, more specifically, in the ITU. The information included in this data set is publicly accessible on the ITU website. Due to the rather intricate structure of the ITU website, however, the creation of the data set requires extensive efforts in terms of data collection, data cleaning and data processing. The focus lies on Member States' and Sector Members' Contributions to the Questions addressed by the various Study Groups. As previously outlined, Contributions are the primary way in which Members can influence the design and the content of ITU standards. The submitted Contributions are extracted for each of the 11 SGs and then combined, resulting in a total count of 50,661 submissions covering the time period from the start of 2000 up to the end of September 2022 (at which point the ITU Plenipotentiary Conference elected Doreen Bogdan-Martin to be the new Secretary-General). After the deletion of submitted Contributions without clear information on the submitting actor, the total count of submitted Contributions is 49,076. These contributions were received from 1686 actors. After correcting for different and incorrect spellings of the same actor, the total count of unique actors is 807. This count also includes 153 national governments. For the remaining 654 actors (including companies, universities, industry associations, etc.), an internet search was conducted to identify the headquarters of each actor and to assign a country of origin. In summary, the data set published with this *Policy Insight* includes 49,076 contributions, each contribution is linked to its title, the data of submission, the contributing actor, the country of origin of the contributing actor, the associated Question and the associated Study Group.

Figure 1 illustrates the first insight from the data set. By far, China is the country from which most Contributions originate. In total, 16,952 (35%) Contributions were received from 78 Chinese actors. The second highest number of Contributions (5963; 12%) was received by 15 Korean actors. The US has

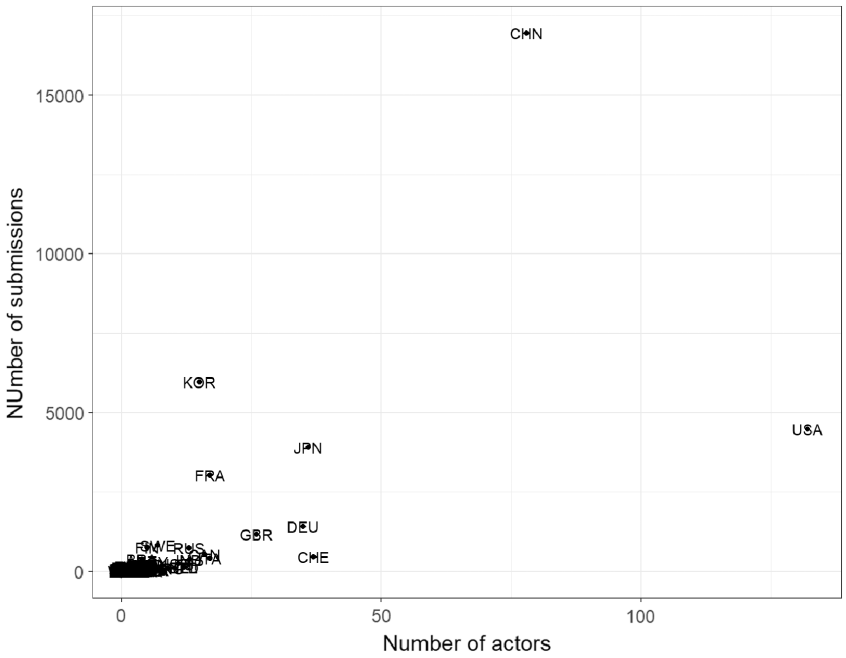

FIGURE 1 Number of actors and the total number of submitted Contributions by country, 2000–2022. *Source*: Author's calculation and illustration.

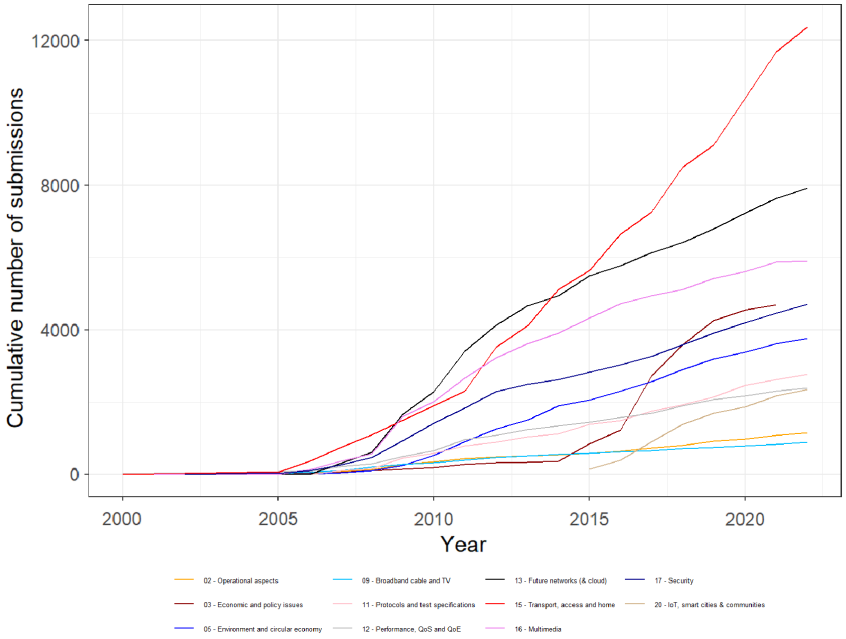

FIGURE 2 Cumulative number of submitted Contributions by Study Group, 2000–2022. *Source*: Author's calculation and illustration.

the largest number of contributing actors (132), number of submitted Contributions (4479) accounts for around 9% of the total Contributions the ITU received between 2000 and 2022.

Before providing more details on countries' respective actors, it is interesting to look at the number of submitted Contributions by SG (Figure 2). Contributions to SG15 on transport, access and home experienced the most significant increase—accounting for 25% of total Contributions. The standards developed by SG15 govern the optical transport networks which enable long-haul global information exchange, define the accessibility of home and power utility networks and support the evolution of smart-grid applications. SG13 on future networks and a cloud received the second largest number of Contributions—accounting for 16%

of total Contributions, followed closely by SG16 on multimedia (12%). The standards of SG13 define technologies related to cloud computing, the Internet of Things and virtual private networks (VPNs). SG16 was, for instance, driving standards for image compression (JPEG) and videoconferencing systems.

To provide further insights into the contributing actors and their countries of origin, Figure 3 illustrates the number of Contributions received from the 10 most active countries. The increase in Contributions by Chinese actors stands out. In 2002, those Contributions accounted for around 4% of total annual Contributions. By 2004, they accounted for 8%, 2010 31%, 2015 33% and 2021 55% of total annual Contributions.

Figure 4 presents the number of Contributions received from the 10 most active companies, five of which are Chinese. Combined, Huawei, ZTE, China Mobile, China Unicom and China Telecom account for almost one quarter of total Contributions received between 2000 and 2022. The other Top 10 contributors include ETRI (Electronics and Telecommunication Research Institute, Korea), Alcatel-Lucent (France), Ericsson (Sweden), Orange (France), and Nokia (Finland).

To better understand the areas of interest of the contributing actors, Figures S1 and S2 illustrate the Contributions by SG for the Top 10 countries and the Top 10 companies. SG15 on transport, access and home is of particular importance to almost all Top 10 countries. 33% of Chinese Contributions went to this SG, for the US SG15 accounted for more than half (51%) of its Contributions. Figure S1 also illustrates some country-specific patterns. For Korean actors, for instance, SG17 on security is also important (23%). Among the Top 10 countries, Contributions from Japanese actors are most diversified. French actors were particularly active contributors in SG16 on multimedia between 2007 and 2017 but Contributions levelled since then. Contributions by German actors have a particular focus on SG12 on performance, quality of service (QoS) and quality of experience (QoE) which accounts for almost half (46%) of their Contributions. Among the Top 10 countries, the United Kingdom is the only country with a strong focus on SG05 on environment and circular economy while the Russian Federation is the only country with a pronounced focus on SG11 on protocols and test specification.

Figure S2 illustrates the focus areas of the Top 10 contributing Sector Members. The five Chinese companies are particularly active in SG15 on transport, access and home. 51% of Huawei's Contributions, 41% of ZTE's Contributions, and 33% of China Mobile's Contributions went to this SG. For China Unicom and China Telecom SG15 accounted for 29% and 17% of Contributions, respectively. A second focus of the most active Chinese actors is SG13 on future networks and the cloud. For ZTE and China Mobile, this SG accounted for 30% of Contributions. China Telecom and China Unicom directed a respective 28% and 24% of Contributions to this SG. Two other SGs in which Chinese companies are particularly active include SG16 on multimedia and SG17 on security. The most active Korean organisation, ETRI, has a similar focus. Almost half (46%) of its Contributions went to SG13 on future networks and cloud, and around 18% to SG16 on multimedia. The most active European company, Alcatel-Lucent (France) directed 55% of its

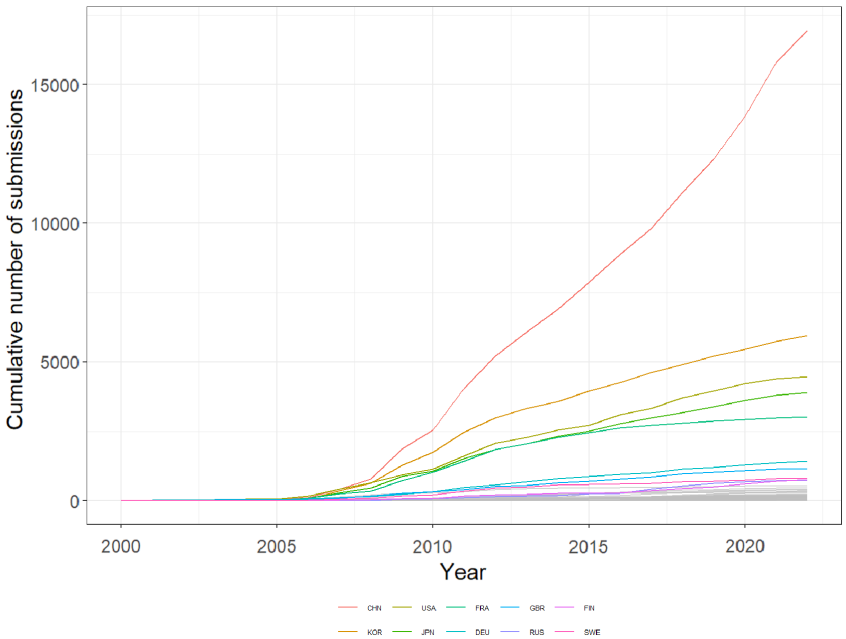

FIGURE 3 Cumulative number of submitted Contributions by Top 10 countries, 2000–2022. *Source*: Author's calculation and illustration.

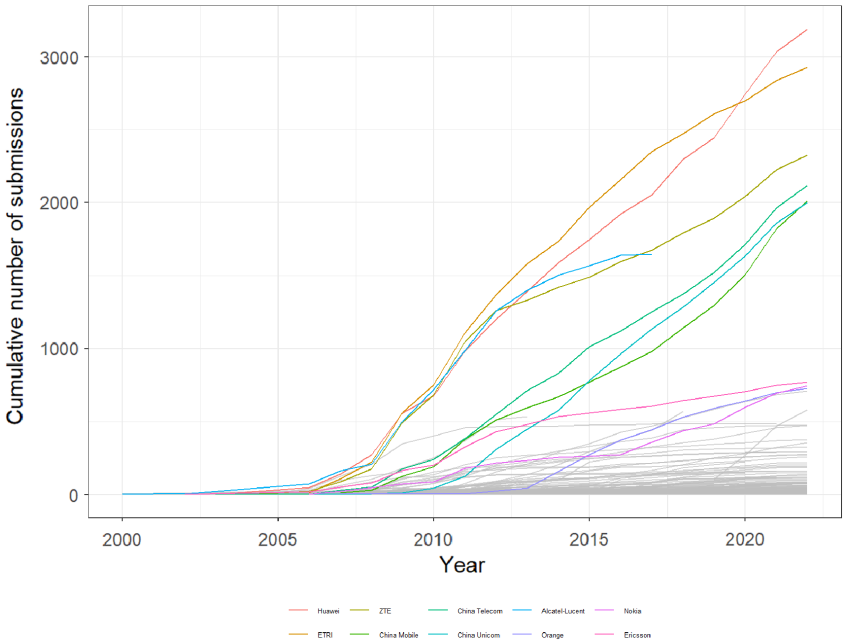

FIGURE 4 Cumulative number of submitted Contributions by Top 10 companies, 2000–2022. *Source*: Author's calculation and illustration.

Contributions to SG16, 22% to SG15, and 17% to SG13. Orange (France) and Ericsson (Sweden) directed a respective 34% and 21% of Contributions to SG05 on environment and circular economy.

SUMMARY AND CONCLUSION

Reinforced by the ongoing technological decoupling of the US and China, telecommunication technology has become increasingly politicised over the last few years. Conscious that the functioning of global telecommunication technology relies on international interoperability and compatibility, government and private actors have strong incentives to shape the underlying standards in their economic and political interests.

The ITU and its Members have long played a central role in setting standards for future telecommunication technology such as 5G. Over the past years, the organisation has become subject to increasing politicisation, culminating in the recent race for the ITU's secretary-general position. In the end, Doreen Bogdan-Martin, the American candidate, secured a clear majority over Rashid Ismailov, the candidate from the Russian Federation. In January 2023, Doreen Bogdan-Martin took over from Houlin Zhao from China who had been leading the ITU since 2015—not always to the satisfaction of the US and its Western allies.

Despite the ITU's importance for the global digital economy, relatively little is known about the actors that drive the organisation's standardisation work. This *Policy Insight* set out to shed some light on the ITU by introducing and discussing a new dataset on government and private actors' contributions to the ITU's standardisation work over the past 22 years. A brief descriptive analysis illustrates that particularly Chinese actors—Huawei, ZTE, China Mobile, China Unicom and China Telecom—have been actively driving the ITU's standardisation processes in the areas of transport, access and home but also future networks and cloud.

The data set introduced here is envisaged as a source which allows researchers to study the reasons and implications for certain actors' involvement in the international standardisation of telecommunication and digitalisation. Indeed, future research may use actors' contributions as the dependent variable to understand why and how actors decide to actively drive standardisation processes. Alternatively, future research may rely on this data set to create explanatory variables that potentially help explain the growing policy divide in areas such as data and digital trade governance. Elsig and Klotz (2021), for instance explore how countries' participation in digital trade-related discussions in the WTO influences the way in which they design the digital trade chapters of their trade agreements. Another factor that affects the design of digital trade and telecommunication chapters in trade agreements may be related to countries' participation in the international standardisation processes that telecommunication and other digital technologies rely on. Building upon the data set introduced here and contributions such as by Foster and Azmeh (2019a, 2019b), van der Marel (2019), and Ferracane (2022), future research may also investigate the extent to which technology standards shape protectionist policies in digital trade.

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DATA AVAILABILITY STATEMENT

The data that supports the findings of this study are available in the supplementary material of this article.

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ENDNOTES

[1] The last time the US held the position of secretary-general, was 1958–1965, Gerald C. Gross.

[2] One example is the North American Numbering Plan (NANP) which conforms with the ITU Recommendation E.164, the international standard for telephone numbering plans (North American Numbering Plan Administrator, 2023).

[3] The World Standards Cooperation is an alliance of the International Electrotechnical Commission, the International Organization for Standardization and the International Telecommunication Union.

[4] Human rights are also becoming a more important topic in other digital standardisation organisations. See, for instance, the work of Cath (2021) on the Internet Engineering Task Force.

[5] For analyses on the progress of this technological decoupling, see, for example Han et al. (2022) and Center for Security and Emerging Technology (2022).

[6] The ITU refers to its standards as 'Recommendations' as they only become mandatory when adopted as part of national law. For simplicity, this article uses the term 'standard(s)'.

[7] For details on the development and approval workflows, please see International Telecommunication Union (2023a).

[8] The ITU works in study periods. The current study period is 2022–2024. Previous study periods were 2017–2021, 2013–2016, 2009–2012, 2005–2008, 2001–2004 and 1997–2000.

[9] For a detailed study on the New IP and the role of Chinese actors at the ITU, see, for example Hoffmann et al. (2020).

[10] This 'balkanisation' is partly driven by competing national interests. See, for instance Drezner (2007) on the US' efforts to shift work from the ITU to ICANN. Other relevant contributions on this topic include Paré (2002), Mueller (2002, 2010, 2017) and DeNardis (2015).

[11] For another detailed review of the ICT standardisation landscape, please see Kanevskaia (2023).

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

Figure S1.
Figure S2.
Data S1.

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