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The Duality of Digital Standard-Setting: Geopolitical Coopetition in a Multipolar World

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Statement of Authenticity

I, Giuliano Catalano, declare that this thesis is a result of my own research investigations and findings. Sources of information other than my own have been acknowledged and a bibliography has been appended. This work has not been previously submitted to any other university for the award of any type of academic degree.

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Any errors are mine alone.

"He who owns the standards, owns the market."

Werner von Siemens, late 19th Century

Abstract

International standard-setting is increasingly falling victim to geopolitical realities. Especially, the digital domain has recently experienced an upsurge in contention. The traditionally consensus-based arena is running the risk of turning into a struggle for power. Against this backdrop, this paper attempts to gain a grounded insight on the roles of China, the European Union, and the United States amid given phenomenon by exploring the current geopolitical power dynamics within the digital standard-setting domain. Incorporating empirical data gathered from a triangulation of methods (including document analysis, a web survey, and elite interviews) this paper demonstrates a duality of both competition, and cooperation within digital standard-setting – hence, a combination of constructing consensus and a struggle for power. In terms of power distribution, said duality occurs in a fragmented world. Accordingly, this paper's deconstruction of the geopolitical power dynamics within the digital standard-setting domain uncovers a coopetition in a multipolar world.

Keywords: *Coopetition, digital standards, digital standard-setting ambition, digital standard-setting capability, digital standard-setting condition, digital standard-setting order, great digital standard-setting power*

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Abbreviations

3GPP	Third-Generation Partnership Project
4IR	Fourth Industrial Revolution
ANSI	American National Standards Institute
AI	Artificial Intelligence
CEN	European Committee for Standardization
CENELEC	European Electrotechnical Committee for Standardization
DSM	Digital Single Market
EC	European Commission
EI	Elite Interviewee
ETSI	European Telecommunications Standards Institute
EU	European Union
ICT	Information and Communications Technology
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IETF	Internet Engineering Task Force
IoT	Internet of Things
IP	Internet Protocol
IR	International Relations
ISO	International Organization for Standardization
ITU	International Telecommunication Union
LS	Likert Scale
NIST	National Institute of Standards and Technology
NSC	National Security Council
PPP	Public-Private Partnership
PRC	People's Republic of China
QCA	Qualitative Content Analysis
SAC	Standardization Administration of China
SDO	Standard-Developing Organization
US	United States
W3C	World Wide Web Consortium
WSR	Web Survey Respondent
WTO	World Trade Organization

Glossary

Digital Standard-Setting Ambition	Refers to the ambition a specific state, or union of states have in standard-setting the digital domain, or aspects of the digital domain.
Digital Standard-Setting Capability	Refers to the capability a specific state, or a union of states possess in mobilizing said ambitions.
Digital Standard-Setting Condition	Refers to the current state of standard-setting interactions and relations within the digital domain.
Digital Standard-Setting Domain	Refers to the digital aspect of the international standard-setting arena.
Digital Standard-Setting Order	Refers to the power distribution within the digital standard-setting domain.
Great Digital Standard-Setting Power	Refers to a state, or a union of states possessing digital-standard-setting ambitions, as well as capabilities to follow through on said ambitions.

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1 Introduction

On September 12th, 2016, the president of the People's Republic of China (PRC), Xi Jinping, addressed the 39th General Assembly of the International Organization of Standardization (ISO) in Beijing. The Chinese president expressed that "standards have become the common language of the world" (Gasiorowski-Denis, 2016). He would go on to say that "together with all countries of the world, we [the Chinese government] are ready to deepen cooperation in standards, enhance exchanges and mutual learning, and improve the system in International Standards" (ibid.). Only two years after these statements were made, "China Standards 2035" (SAC, 2022) was launched – a blueprint for the Chinese government and industry to set international standards for nascent digital technologies. Although some were quick to denounce the plan as an attempt to "rewrite the rules" (Sacks, 2018), others dismissed such alarmistic voices as being not more than mere "hype" (Wilson, 2020). Nonetheless, one thing became clear: reactions were provoked.

On the one hand, on May 20th, 2020, the National Security Council (NSC) of the United States (US) published its "Strategic Approach to the People's Republic of China" (NSC, 2020) in which it announced it would "continue to work with our [American] allies and partners to ensure that discriminatory industrial standards do not become global standards" (NSC, 2020, p. 13). In the context of this specific report, discriminatory industrial standards obviously referred to those developed and set by China. A couple of months later, the "Ensuring American Leadership over International Standards Act of 2020" (Cortez Masto, 2020) was introduced at the 116th Congress to extend the focus on American leadership in international standards to emerging technologies.

On the other hand, on February 2nd, 2022, the European Commission (EC) presented a standard-setting strategy outlining the European "approach to standards within the Single Market as well as globally" (EC, 2022b). The European Commissioner for the Internal Market, Thierry Breton, declared standards as being of "strategic importance" (ibid.), making the strategy of the European Union (EU) a counteroffensive to China and the US (Cerulus, 2022; Espinoza & Pop, 2022). In fact, Europe's capacity to ensure technological sovereignty, limit dependencies and protect European values would rely on its ability to be a "global standard-setter" (EC, 2022b), so Breton said. Consequently, the EU was "crystal-clear" (ibid.) about creating the "conditions for European standards to become global benchmarks" (ibid.).

Against this backdrop, Xi Jinping's 'common language of the world' has meanwhile transformed into a strategic project that everybody is racing to delineate. International standard-setting is increasingly turning political, after having long been a realm of purely technical decision-making. Particularly, digital technologies took on a stronger standard-setting focus in recent years. The eruption of nascent digital technologies introduced multifunctional innovations such as Artificial Intelligence (AI), the Internet of Things (IoT), or quantum computing with unravelling potential and capabilities – and while technological innovation is moving forward, so is the political race to be at the very forefront of these developments.

Above all, China and the US compete to come out on the better end. Thereby, China declared nascent digital technologies its gateway to technological superiority. Naturally, the US felt challenged and introduced a series of measures to contain its counterpart and maintain American technological leadership. This technological competition has incrementally turned into a strategic rivalry, meaning that the globally interdependent technological landscape is not considered mutually beneficial any longer. As a matter of fact, in recent years, decoupling dynamics became more relevant in popular discourse. According to such realities, the Sino-American relationship is steadily deteriorating and interdependence in the technological realm is not a given anymore. Thus, the question emerges as to what lies at the bottom of this technological conquest.

The most obvious answer is a first mover position – ascertained by being out before anybody else. This position provides a competitive advantage that lies in the ability to set (digital) technical standards. These standards *per se* are not political. On the contrary, they are benign, technical specifications that aim at establishing compatibility, interoperability, safety and transparency across products, services, and technologies, devoid of any geographical barriers (Cargill, 2022). However, apart from constituting a competitive advantage, standards are also discrete and transformative: "discrete because often born out of arcane technical discussions; transformative because once a standard has taken over, rarely is it overturned" (Bishop, 2015). Thus, although oftentimes unnoticed, (digital) technical standards have become a strategic element in the Sino-American technological competition.

The issue is that said development is unfolding in a consensus-focused arena that, in the past, has been dominated by the West. Historically, the EU had an important role in this and, indeed, long punched above its weight (Rühlig & ten Brink, 2021). Although the EU is interested in

maintaining its standard-setting stronghold also in the digital domain, the increasing Chinese digital standard-setting efforts seem to put the EU at risk of waning standard-setting capabilities. Ultimately then, the digital standard-setting realm has fallen victim to geopolitical tendencies. The observation of this phenomenon leads to the major question of as to how the geopolitical power dynamics within digital standard-setting can be understood?

Geopolitical tendencies within standard-setting are *per se* not a new phenomenon. Early papers discuss how international standard-setting reflect the power distribution within the international system. With the use of realist worldviews, Krasner (1991) or Drezner (2007), for example, showcase how international governance is unfolding in an international system that has no overarching, policing authority and thus is fragile to power games. Dissatisfied with realist accounts, constructivist contributions, such as Loya and Boli's (1999) world society approach, define international standard-setting as an inherently cooperative endeavor, devoid of any first mover advantages or distributional implications. Meanwhile, the consensus is that such advantages and implications exist, especially for digital standards. Liberal institutionalist notions, such as the institutional complementarity approach of Mattli and Büthe (2003) therefore investigate how cooperation unfolds where contentions exist.

Aside from theoretical elaborations on international standard-setting with realist, constructivist and liberal institutionalist tendencies, the idea of standards being an explicit geopolitical tool, in the form of Bishop's (2015) concept of "Standard Power," entered the academic discussion only more recently. Especially, the ascendence of Chinese influence in international standard-setting, and the digital standard-setting domain, sparked an interest in the geopolitics of standards and led to an amalgam of expertise in the form of academic contributions, reports or whitepapers (e.g., Creemers & Voo, 2021; Rühlig, 2022a; Seaman, 2020). However, these contributions focusing mainly on China's recent rise are increasingly alarmistic in that they voice concerns about the risk of bifurcating, fragmenting, and decoupling realities within international standard-setting (e.g., Huotari et al., 2021).

What seems to be missing against the backdrop of an ever more geo-politicized arena, is a paper that addresses if given development has introduced a new understanding of international standard-setting. Has the arena turned into a struggle for power, or is it continuously constructing consensus? The exploration of this inquiry is significant because international standard-setting, up until now, has largely been a product of consensus-based procedures.

Should this turn into a struggle for power, it can certainly have unwanted effects. Since the given issue is unfolding in the international realm, it is only appropriate to tackle the phenomenon from an International Relations (IR) perspective. Accordingly, this thesis project is guided by the following research question: *How are the geopolitical power dynamics within the digital standard-setting domain to be understood from an IR perspective?*

Ergo, by using the digital domain as subject of inquiry, the objective of this thesis project is to engage in the broader discussion of the role of great powers in international standard-setting, and more specifically, explore the current geopolitical power dynamics of the digital standard-setting domain with an IR lens. The fact that previous contributions have not explicitly approached the phenomenon from such a perspective, makes of this thesis project a potentially helpful layer to the broader discussion around geopolitics of standards. Moreover, since there is no ideal approach to explore the phenomenon from an IR perspective, a heuristic conceptual framework is sketched out to guide the analysis of the matter at hand.

Four explanatory factors (i.e., digital standard-setting ambition, digital standard-setting capability, digital standard-setting condition, and digital standard-setting order) are proposed to account for the phenomenon. The first concept tries to define the digital standard-setting ambitions of China, the EU, and US by investigating their respective strategies and contextual information. The second concept attempts to capture the digital standard-setting capabilities of China, the EU, and the US by shining a light on intangibles of digital standard-setting, as well as relating them to the respective digital standard-setting ambitions. The third concept, being the digital standard-setting condition, pins down the current state of digital standard-setting, whereas the last one, the digital standard-setting order, suggests an understanding of the power distribution within the domain a unipolar, bipolar, or multipolar.

This conceptual framework is adopted in an exploratory fashion since the matter at hand has been little researched up until now. Thereby, to achieve meaningful results within this exploratory endeavor, a qualitative research design is administered. To be more specific, a triangulation of methods is employed. This triangulation includes a document analysis, a web survey, and elite interviews, which are chosen due to their reciprocal complementarity. Thereafter, the collected empirical material is analyzed using a Qualitative Content Analysis (QCA).

Against this backdrop, the following thesis paper will be structured as follows. Over the course of seven sections, the following chapter establishes the core issue by discussing the impact of nascent digital technologies, the Sino-American strategic rivalry, the stimulus that lies at the bottom of this dispute, and the impact it has for digital standard-setting and the EU. Chapter 3 captures the academic discussion that has been held around the geopolitics of standards. Since little academic contributions exist, reports, and whitepapers are also brough to attention. The chapter is concluded with a delineation and demarcation of the thesis project. Chapter 4 sketches out the conceptualization. It goes through four explanatory factors to present the conceptual framework used to assess the gathered empirical material. Chapter 5 showcases the methodological approach. It meticulously discusses the various steps employed to guarantee a trustworthy end-product. Chapter 6 lays out the results derived from the gathered data, before Chapter 7 engages in a discussion binding together the conceptual framework and the results. Lastly, a conclusion completes the paper.

2 Setting the Stage

The significance of nascent digital technologies is not only paramount for the contemporary world, but also for the development of a sound argumentation within this paper. Therefore, the allure of nascent digital technologies will be subject matter of the opening section of this chapter, whose aim is to lay the foundations of this paper by introducing the issue constituting the very core of this thesis project. The subsequent three sections see an unfolding of the Sino-American technological rivalry take place, before the stimulus is explored that lies at the bottom of this competitive contest. Thereafter, a delineation of digital standards will be provided, as well as a short overview of the digital standard-setting domain. The last section touches upon the recent geopolitical reflections associated with digital standards, and simultaneously questions the European role amid the broader Sino-American technological rivalry.

2.1 The Allure of Nascent Digital Technologies

Unprecedented connectivity speeds and processing power have facilitated the eruption of an array of nascent digital technologies (or emerging technologies) with the potential of fundamentally reshaping the world's level playing fields. Although their capabilities are still somewhat uncertain and ambiguous, a range of technologies, such as AI, IoT, or quantum computing, have already introduced new modes of utilization for products and processes to the world. For example, autonomous vehicles function with the knowledge of AI, smart cities come to life through the application of IoT, or evermore complex algorithms are created with the help of quantum computing. As such, nascent digital technologies emanate an unquestionable potential in terms of power, which is transmitting into economic expenditure. For example, the global amount of US$ invested into quantum computing, as of 2023, is believed to be around 35.5 billion (WEF, 2023). At the same time, this uncanny potential has oftentimes been the basis for speculation. Some consider the capabilities of nascent digital technologies an instrument to advance the betterment of societies, others consider them a threat to humans like no other technological innovations had ever posed before (Hagemann Snabe, 2022; Joy, 2000).What is for certain though, is that the eruption of nascent digital technologies has become the breeding ground for a transformation, commonly referred to as the "Fourth Industrial Revolution" (4IR) (Schwab, 2016).

Therefore, experts have argued that in the context of policymaking, emerging technologies are perceived to have the ability to modify the status quo (Rotolo et al., 2015). This does not come as a surprise considering the decades-long impact technological innovation has had on international relations and global affairs. Notable examples are the acceleration of nuclear proliferation through technological innovation during the Cold War, and more recently, the development of functioning vaccines during the Coronavirus pandemic. In effect, it is of the utmost importance to study nascent digital technologies and their undeniable impact, economically, as well as politically, and societally because as technological innovation is moving forward, the global power dynamics within the digital domain are gradually being shaped. Figuratively speaking, this means that technological superiority is once again up for grabs. Naturally, the great powers want in.

2.2 Indigenous Innovation: China's Vehicle to Technological Transcendence

China is particularly taken aback the allure of nascent digital technologies, which led it to draft a blueprint sketching out a path towards technological transcendence. Since the Chinese government is of the opinion that imminent technological innovation will shape history and decide who leads the race for technological supremacy by the end of the next decade, the 4IR constitutes a chance for China to "catch up [to] and surpass" (Russel & Berger, 2021a) the West, thereby introducing a shift in the balance of power (Doshi, 2020). Therefore, China has emphasized the acceleration of "breakthrough" (Du et al., 2019, p. 63) technological innovation policy-wise and introduced a series of efforts to leapfrog the West creating a "great divergence" (Doshi, 2020, p. 3) in terms of technological prowess.

This strategic technological blueprint evinces a clear tendency towards building and maintaining technological independence (Fedasiuk & Weinstein, 2021). As a matter of fact, the focus on self-reliance is part of a more comprehensive plan overseeing Chinese science and technology policies. It is referred to as "indigenous innovation" (Waldie, 2022) and gained momentum under Xi Jinping rule. As an example, in 2020, premier Li Keqiang announced that China planned to spend US$ 1.4 trillion over the next five years to build up indigenous means in areas such as AI, data centers, and mobile communications (Lin, 2020). Two policies that addressed these Chinese ambitions associated with indigenous innovation were "Made in China 2025" (Wübbecke et al., 2016) and its twin "Network Great Power" (de La Bruyère, 2021b). The former was introduced by premier Li Keqiang in 2015 as a ten-year plan to

transform the own high-tech industries, whereas the latter was "designed to capture the leapfrog opportunities of the digital revolution" (de La Bruyère, 2021b, p. 8). Their objectives were to become a "world manufacturing power" (The State Council of the PRC, 2017) and a global cyber power.

2.3 American Technological Leadership: Waning or Unchallenged?

The ambitious Chinese efforts in the field of nascent digital technologies naturally challenge American technological leadership resulting in an American change of heart, in terms of considering the Sino-American technological interplay a mutually beneficial condition. Most recently, a "Special Envoy for Critical and Emerging Technology" (DOS, 2023) was appointed. This is a perfect example of what Bateman (2022) considers an "offensive measure" (p. 14) – advances that aim at nurturing the American technological prowess. However, during the Trump administration, and since Joe Biden took office, "defensive measures" (ibid.), which are mainly about containment, dominated the technological policy agenda of the US. In a first instalment, such 'defensive measures' boiled down to punitive tariffs, handed out during the Trump administration, and indebted to, according to the US, China's use of unfair means in the Sino-American technological competition (Beattie, 2019). However, in a second instalment, American discontent about Chinese unfair competition practices was coupled with national security concerns, transcending American thinking into a constant state of policy review and an entirely new sphere of measure-taking. Measures such as export controls, import restrictions, financial sanctions, and even law enforcement were taken, turning a mere competitor into a strategic rival (Bateman, 2022).

Against the backdrop of technological leadership being "the main driver of political influence and economic power" (Demarais, 2022), one question begs to be addressed: is American technological leadership still unchallenged, or waning in the light of a rising China? The growing consensus points toward waning American technological prowess, which seems to coincide with China's rapidly advancing technological capabilities (Doshi, 2020). In fact, Chinese investments into research and development, sophisticated technology policies, increasing manufacturing power, and international rule-making efforts are adding another layer to the theoretical discussion around China's gradual passage from keeping a low profile, to striving for achievement (Yan, 2014). This development puts the US in a precarious position in which a reversal of the downward-facing trend is coupled with complex challenges. In any

case, the recent American responses towards China are only contributing to further straining the already fragile relationship. Sino-American ties seem to be far detached from experiencing an extent of normalcy anytime soon. On the contrary, it is believed that the Sino-American strategic rivalry is only aggravating the dynamic (Weinland, 2022).

2.4 The Race to Attain First Mover Advantage

What often seems to go unnoticed within the broader discussion of the Sino-American strategic rivalry, the conquest of the 4IR, or the play for technological supremacy, is the stimulus that lies at the bottom of it all. Although unfair competition practices and national security considerations are legitimate areas of concern, "unfavorable outcomes" (Bateman, 2022, p. 105) constitute the very core of the Sino-American strategic rivalry. Such outcomes translate to a zero-sum game of some sorts with "distributional consequences" (Krasner, 1991, p. 337). If one power wins the race to technological supremacy, it will necessarily bear 'unfavorable outcomes' for the counterpart. To circumvent such negative outcomes, great powers need to lead, in this case, in technological innovation.

By doing that they get ahead of their competitors and attain a first mover position. A first mover position is essentially ascertained by introducing, for example, a technology, product, or service simply before anyone else (Tarver, 2020). As, historically speaking, technological development was most sophisticated in Western economies, the position was long reserved to the West. However, with the up-and-coming nature of nascent digital technologies, "the norms, standards, infrastructure, regulations, and business models that will define the future are still emerging" (Philbeck & Davis, 2018, p. 21). Thus, in correlation with technological superiority, the first mover position is once again up for grabs.

Since China has long been a late comer, it is particularly invested in this (Seaman, 2020). As established earlier, the thought of achieving technological supremacy through indigenous, 'breakthrough' technological innovation and thus obtaining a first mover position, drives their technological policy efforts. The US, however, is not sitting back and letting Chinese ambitions unfold. On the contrary, it is actively containing Chinese efforts to maintain American technological leadership and keeping the position in the West. As such, the reasoning behind the desire to obtain the first mover position diverges. Yet, it is of little significance in comparison to the competitive advantage it provides.

In the context of nascent digital technologies, as mentioned, a clear delineation of how products should take form, or processes should unfold, is still missing in many instances. The capability to shape such peculiarities is what the first mover advantage provides: it enables one to set product and process guidelines (Cohen & Fontaine, 2020). In that sense, technological superiority is not only related to the capacity to innovate and develop cutting-edge technology, but also inherently to the ability to set technical standards (Chow, 2013). Ultimately then, the stimulus lying at the bottom of the Sino-American strategic rivalry is to circumvent 'unfavorable outcomes' by racing to attain the first mover advantage, which takes the form of setting (digital) technical standards internationally.

2.5 Defining (Digital) Technical Standards

Much of the technological innovation that has led to the globalized world we live in today is based upon technical standards. In fact, "technical innovation has been interrelated with standardization" (Wang, 2011, p. 6) for centuries. Yet, when it comes to its terminology, there is not one single formulation. Instead, definitions vary:

> *"Standards are the distilled wisdom of people with expertise in their subject matter and who know the needs of the organizations they represent – people such as manufacturers, sellers, buyers, customers, trade associations, users or regulators."*
> –ISO (s.a.)

> *"A standard is an agreed way of doing something in a consistent and repeatable way. Standards set minimum requirements in terms of safety, reliability, efficiency and trust."*
> –IEC (s.a.)

> *"[Standards are] normative recommendations […] that define how telecommunication networks operate and interwork."*
> –ITU (s.a.-a)

Nevertheless, some recurring wordings can be combined to present a general definition: a technical standard is a voluntary product or process specification for a repeatable technical task. Its aim is to provide transparency, ensure safety, permit interoperability, and guarantee

compatibility beyond state borders, and across technologies and industries. In fact, "without technical standards, technologies of two suppliers could hardly be complimentary" (Rühlig, 2022a, p. 2). The digital extension of technical standards covers guidelines that support the seamless interplay between digital technologies. Such standards can include internet standards, web standards, or standards concerning digital networks and digital infrastructures, but also in relation to emerging technologies (Digwatch, s.a.).

The ultimate objective of a standard is broad adoption. This is important to ensure "trade between countries, create new markets, cut compliance costs and support the development of national, supranational, and global markets" (Šimunić & Pavić, 2020, p. 1). A good standard is then both globally accepted and available (Rühlig, 2022a). In other words, the broad adoption of a standard should be facilitating in the sense that it enables the globalized economy to function. How uptake at scale is achieved, however, does not really matter. Since a standard is, theoretically, "morally neutral, is neither wrong or right, and, in and of itself, is a benign document" (Cargill, 2022), it is of little importance whether a standard is developed and adopted *de facto*[1], or *de jure*[2] (Carpenter, 2012). However, "the same is not true of standardization, the discipline that creates standards" (Cargill, 2022). Indeed, it is where areas of contention arise. To understand this dynamic one must dwell deeper into the standard-setting world.

2.6 The Digital Standard-Setting Domain

Contemporary standard-setting has its roots in industrializing times. As a matter of fact, when industrialization swept over Europe and the US in the second part of the 19th century, the process of manufacturing was gradually divided up since products became increasingly sophisticated. "Technical non-coordination, incompatibility among products, or un-interchangeability among spare parts" (Wang, 2011, p. 8) followed as unwanted side-effects of the division of product and labor. Suddenly, economic interest arose in relation to standardizing products and processes. Considerations around efficiency and competitiveness meant that private self-regulation became a logical avenue to pursue. As a result, private institutions,

[1] A de facto standard has typically achieved acceptability through market uptake. It has not undergone any kind of consensus-based formal process, but is accepted broadly due to its market domination (Carpenter, 2012).
[2] A de jure standard has been developed through a consensus-based formal process. Typically, the process is driven by an SDO, whereas the standard is developed according to WTO guidelines (Carpenter, 2012).

known today as a Standards Developing Organization (SDO), started emerging, solidifying "the empowerment of private actors" (Rühlig, 2022a, p. 2) in standard-setting.
Today, international standard-setting, or the digital standard-setting domain more specifically, functions through a public-private partnership (PPP) that showcases an interplay of myriad institutions. They vary, *inter alia*, in their "level of recognition from regulatory or political organizations" (Abdelkafi et al., 2021, p. 22). Generally, a differentiation is made between formal SDOs, quasi-formal SDOs, and industry consortia. Starting with the latter, the aim of industry consortia is "to promote a highly focused market sector" (Schneiderman, 2015, p. 254). They are usually described as "alliances of like-minded companies" (Teubner et al., 2021, p. 3) that try to push standard-setting in a specific product category, or market – meaning that they have narrower interests than quasi-formal or formal SDOs.

Quasi-formal SDOs are alike formal SDOs in many aspects. Due to their significant size, organizations such as the Institute of Electrical and Electronics Engineers (IEEE), the Internet Engineering Task Force (IETF), the 3rd Generation Partnership Project (3GPP) and the World Wide Web Consortium (W3C) have developed standards that are well-established within the industry (Teleanu, 2022). This has earnt them a status comparable to that of a formal SDO. The only major difference is that quasi-formal SDOs such as the IEEE, IETF, the 3GPP and the W3C are not formally recognized by a national or supranational authority (Teubner et al., 2021).

Formal SDOs are internationally (or nationally) formally recognized standard-setting bodies (ITU, 2021). In the digital domain, the SDOs with the most leverage include the International Electrotechnical Commission (IEC), the ISO, and the International Telecommunication Union (ITU) – a specialized Information and Communications Technology (ICT) agency of the United Nations. Collectively, these three institutions constitute the World Standards Cooperation, which was created as a collaboration to "strengthen and advance the voluntary consensus-based international standards system" (ITU, s.a.-b).

This focus on consensus is central in international standard-setting. Unlike other fields of governance, international standard-setting is very much built on the foundation of consensus-based decision-making. This means that standard proposals are brought afore in multi-stakeholder processes with the aim of achieving acceptance by all, or at least a big majority. This is grounded in the fact that, as established earlier, a good standard is dependent on broad

availability and acceptance, and the importance of interoperability. Simultaneously, it is generally assumed that standard-setting in the international realm go about in accordance with the principles for the development of standards set by the World Trade Organization (WTO). These include "transparency, openness, impartiality and consensus, effectiveness and relevance, coherence, and development dimension" (WTO, s.a.).

Nonetheless, areas of contention are incrementally arising. By ensuring that membership, and participation in SDOs is open to all coupled with the tenets of the WTO, theoretically, a fair level playing field is created for the development and adoption of standards (Mattli & Büthe, 2003). However, international standard-setting has long been dominated by the West. Against this backdrop, "a formula that describes the best way of doing something" (ISO, s.a.), was long a Western best way of doing something. With increasing participation of so far inactive, or little active members, this is gradually shifting. Especially, China is making itself heard. This is significant because as new interests and objectives find their way into international standard-setting, uncoordinated with those of the dominating powers, areas of contention arise – and standards, in this case digital standards, take on a political layer.

2.7 Digital Standards, Sino-American Rivalry, and the European Role

What has been established over the course of this chapter is that the Sino-American technological competition has turned into a strategic rivalry, which is gradually transcending into the digital standard-setting domain due to the competitive advantage digital standards omit. Accordingly, digital standards have accumulated "wider strategic resonance" (Creemers & Voo, 2021, p. 4) under the umbrella of the Sino-American technological rivalry.

However, China has long recognized that the digital domain, and more specifically, digital standards are key in reshaping the technological power dynamics. A Chinese proverb amongst industrial circles illustrates this clearly: while lower-tier companies create products and advance technology, top-tier companies set standards (Ding et al., 2018; He, 2022; Zhan & Zhu, 2007). Since technical standards "were largely written in a predigital age" (Cohen & Fontaine, 2020), China turned international standard-setting into a crucial part for the functioning of China's vehicle to technological transcendence and thus formulated their indigenous innovation policies in a way that emphasized the need of becoming a "standards maker" (Baark, 2019, p. 7), rather than remaining a "standards taker" (ibid.).

In the digital domain, probably the most famous example of an effort to become a 'standards maker' was a technology aimed at reinventing the internet's core architecture, being the Transmission Control Protocol and the Internet Protocol (IP). The controversy around the standard-setting effort, commonly referred to as "New IP" (Jiang, 2019) and initiated by Huawei in 2018, was essentially, that it had the potential to splinter the internet. This raised concerns with some delegations, but only underpinned others suspicion that China was increasingly ramping up international standard-setting efforts in the digital domain to champion their ambition at technological supremacy (Hoffmann et al., 2020).

Specially, the US considered the Chinese *modus operandi* threatening to its technological dominance. As touched upon in the introduction of this paper, the US published a 'Strategic Approach to the People's Republic of China' during the Trump administration, in which it did not necessarily focus on standard-setting, yet the word 'standards' appeared no less than ten times throughout the report (Lee, 2021). Thereby, the US made very clear that it would collaborate with like-minded allies, through for example, partnerships like the "EU-US Trade and Technology Council" (EC, s.a.), to contain 'discriminatory industrial standards' by China, and thus "the biggest global threat" (Leonard, 2021) being "China the rule-maker" (ibid.).

However, the increasingly assertive Chinese standard-setting efforts in the digital domain are not only challenging the US but do also have implications for an actor that has been looming in the background over the course of this chapter – the EU. Europe is increasingly finding itself "squeezed in between the growing US-China technological power rivalry" (Rühlig, 2020, p. 5). Thereby, it is certainly clear that the EU cannot quite compare to China or the US in terms of traditional means, and hence is, to a certain extent, powerless in the global race for technological superiority.

Yet, the EU has had means to assume considerable international sway in the past. In fact, it is known to be a regulatory superpower. Through the process of "unilateral regulatory globalization" (Bradford, 2020, p. 25), the EU can exercise regulatory power like no other. The process, which is referred to as the "Brussels Effect" (ibid.), gives the EU the ability to *de facto* externalize its regulatory efforts. Thus, some have attempted to translate the 'Brussels Effect' into a geopolitical tool. According to Anu Bradford, who coined the term, "that is a mistake" (Kuo, 2021), since the 'Brussels Effect' is "at its heart a manifestation of bureaucratic power

that has been successful in large part because it has not been politicized" (ibid.). The same rings true for standard-setting in that it has been successful due to little politicization. Since the EU is a bureaucratic powerhouse, it has been able to establish itself as a "bastion of international technical standardization" (Rühlig, 2020, p. 5) over the last decades. In fact, it has been punching above its weight (Rühlig, 2021a).

However, in the digital domain the EU is lagging. In fact, Europe only accounted for two technology companies among the 20 largest in 2022 – none of them being in the top 10. The large majority was constituted by American and Asian technology companies (Ponciano, 2022). The fact that such companies are crucial parts of the international standard-setting machinery underpins the introducing presumption and seems to evince how the Chinese rise in standard-setting is constituting a bigger challenge to the EU than the US. This has led experts to argue that "a comprehensive [European] strategy" (Creemers & Voo, 2021, p. 23) was needed "to shaping the technological sphere in a way that benefits European interests" (ibid.). In February 2022, such as strategy was presented by the EU.

Against this backdrop, digital standards are not only taking on a political layer due to its 'strategic resonance', but at the same time are the power dynamics within the digital standard-setting domain increasingly turning geopolitical. Thus, by tying together previous subchapters and bringing the EU into the picture, the question, as to how these geopolitical power dynamics within digital standard-setting can be understood, arises.

3 Capturing the Academic Discussion

The idea that the standard-setting realm can showcase geopolitical tendencies is not a new concept. In the early 1990s, Krasner (1991) used the example of global communications to evince how "no single international regime" (ibid., p. 336) existed, but rather a few powerful states decided how to govern the world. In his paper, he claims that in global communications (e.g., telecommunications) the international realm is governed by "a variety of principles, norms, rules, and decision-making procedures–or, in some cases, by no regime at all" (ibid.). As the paper progressed, standards did also become subject of attention. His main point was that if such governing types (i.e., norms, rules, standards, etc.) had 'distributional consequences', they led to conflictual circumstances in which the variation in the outcome of said governing types was the result of "interests and relative power capabilities of the actors in each case" (ibid.).

Thereby, Krasner (1991) argued along the Pareto principle[3]. In that sense, the powerful few that retained 'relative power capabilities' were the ones essentially deciding "who wins and who loses" (ibid, p. 366) in questions of governance. One example that illustrated that clearly, according to Krasner (1991), was radio broadcasting. This has been discussed in much more detail in an academic contribution by Sung (1992), which gave another example of early geopolitical discussions around standards. This paper assessed how political changes at the time, especially the European integration process, had an impact on the World Administrative Radio Conference in 1992, in that it gave a unified Europe a tremendous advantage over other actors. The author argued that said shift created a European voting bloc, which agreed upon common positions months before the conference was held (ibid.).

To return to the argument of Krasner (1991), what can be additionally stated is the fact that he took on an inherently realist perspective. His elaborations in the form of 'no single international regime' or 'relative power capabilities' were starkly influenced by realist worldviews consumed by the belief that states act in an anarchic system striving for power to ensure self-preservation (Waltz, 1979). Similarly, Drezner (2007) later argued that international standard-setting did not only reflect the international distribution of power, but also, that the influence

[3] The Pareto principle holds that "although there are often many causes for any observed phenomenon, it is often the case that a small subset of those causes are responsible for most of the observation" (Brock, 2022).

of non-state actors in international standard-setting was largely exaggerated *vis-à-vis* the impotence of states.

Dissatisfied with the realist perspective of standard-setting, Loya and Boli (1999) declared that "the principles of the standardization sector are […] irreducible to the global system of states locked in competition for political, military, and economic domination" (ibid., p. 197) and that "the deadly competitive struggle between states is not permitted to shape the products of global standards organizations" (ibid.). The main point of their contribution was that technological rationality outranked power dynamics in standard-setting. They proposed the use of the theory of world society to explain "standardization as a world-polity process" (ibid., p. 192).

Since said theory is part of the broader English school in the field of IR, this paper, unlike previous contributions, adopts a constructivist layer, rather than taking realist realities for granted (Buzan, 2001). According to this perspective, international standard-setting is an inherently cooperative endeavor "devoid of distributional consequences" (Mattli & Büthe, 2003, p. 14) actuating no first mover advantage. This approach then is contrary with this thesis' presupposition that digital standards have 'distributional consequences' and actuate a first mover advantage. As such, the world society approach, unlike the realist lens, makes for no appropriate theoretical basis.

A similar conclusion was reached by Mattli and Büthe (2003), which is why they introduced the theory of institutional complementarity to the standard-setting realm. They have established that, as a basic ground rule, when an international institution is the clear focal point in a governing activity, which is the case in international standard-setting, the institution is significant for matters of cooperation because it selects "who will be recognized or at least privileged as an actor" (ibid., p. 41) and shapes "the resources that may be legitimately used in the institutional process […] bestowing power upon actors" (ibid.). In other words, Mattli and Büthe's (2003) employment of institutional complementarity provides interesting insights into "institutionalized international cooperation among nonstate actors more generally" (p. 41). In the context of IR, this means that the approach was heavily influenced by liberal institutionalist notions.

The idea that geopolitics have actually entered international standard-setting, and the digital standard-setting domain, became a wide-spread belief only more recently. In a 2015 article,

Bishop (2015) coined the term 'Standard Power' to define "the skill of using standards to build fresh geopolitical leverage" and thus introduced the concept of standard-setting being an explicit geopolitical tool.

Especially, since the intensifying of the Sino-American rivalry, said concept created food for thought – resulting in an amalgam of analyses and expertise in the form of mainly reports and white papers, and some academic contributions. Lee (2021), for example, argues that China's increasing digital standard-setting efforts coupled with protectionist US responses introduce a "Standards World War" (p. 44).[4] In his view, digital standards are not immune to externalities in the form of geopolitical, or geo-economic power plays although they are morally neutral, and benign. Thus, in an era of technological tension, trade warfare, and "weaponized interdependence" (Farrell & Newman, 2019, p. 42), the Sino-American rivalry has translated to the digital standard-setting domain, so Lee (2021) argued, and introduced geopolitical logics to international standard-setting.

What becomes evident though, is that the majority of contributions focusing on the geopolitics of standards, concentrate very much on the growing influence of China (e.g., Creemers & Voo, 2021; de La Bruyère & Picarsic, 2020; de La Bruyère, 2021a; de La Bruyère, 2022; Ding, 2021; He, 2022; Nanni, 2021; Neaher et al., 2021; Russel & Berger, 2021b; Seaman, 2020; Taylor & Pollock, 2021; Teleanu, 2021). Rühlig (2022a), for example, thematized Chinese influence through technical standardization power to showcase that "technical standardization is a crucial arena" (ibid., p. 16) of the Sino-American geo-economic rivalry, particularly in the field of emerging technology. Thus, substantiating the basis upon this thesis project builds. It is said author that has also produced the most substantive amount of expertise on the geopolitics of standard-setting (e.g., Rühlig, 2020; Rühlig, 2021a; Rühlig, 2021b; Rühlig & ten Brink, 2021; Rühlig, 2022b).

Within this discussion of increasing Chinese influence, alarmistic tones come up continuously. Taylor and Pollock (2021), for example, stated that "Chinese representation through key leadership roles in technical standards risks creating imbalances, and at worst could result in the adoption of standards that turn the network into an instrument of surveillance–as in New

[4] In the business realm, standards wars refer to "battles for market dominance between incompatible technologies" (Shapiro & Varian, 1999, p. 8).

IP" (p. 4), whereas de La Bruyère (2022) added that "China's standards influence is both growing and far greater than most analysts recognize" (p. 52). Seaman (2020) took a more subtle approach by declaring that the Chinese dual-track approach to standard-setting was reflected in "greater cooperation and convergence" (p. 4), but also "a broader fragmentation or bifurcation" (ibid.).

This 'fragmentation and bifurcation' is something that is increasingly mentioned in standards discourse in relation with economic and technological decoupling. Decoupling is a process of fragmentation, or bifurcation and refers to nothing other than a partial discontinuation of cross-border trading of goods and services. Within the Sino-American technological competition, it refers to a hiatus in the highly interweaving Sino-American technological ecosystem (Fischer, 2022). In the context of economic, or technological decoupling, Huotari et al. (2021) characterized standards as an area of "rapidly growing concern" (p. 4). What is problematic with this concept, is the fact that said disruption creates different "industrial blocs" (Kynge & Liu, 2020).

This dynamic is sometimes referred to as a new cold war because it encourages the emergence of different spheres of influence, mainly along a Western-led front and a Chinese-led front (Yan, 2020). Thus, it breaks with the assumption that interdependent technological connectivity is a necessary basis for the functioning of a globalized economy. Correspondingly, transferring these decoupling dynamics to the digital standard-setting domain is not only counterintuitive, and almost non-sensical, considering that economic trade on a global scale assumes interdependence and interoperability of products and processes, but extremely risky. Risky because if interoperability is not a given in the digital standard-setting domain any longer, digital standards become largely useless.

Against the backdrop of an ever more geo-politicized international standard-setting arena, what has not been addressed up until now is the question as to if this development has introduced a new understanding of international standard-setting in the sense of a struggle of power. The exploration of this inquiry is significant because international standard-setting has traditionally been a product of consensus-based procedures. *Ergo*, by using the digital domain as subject of inquiry, this thesis project attempts to engage in the broader discussion of the role of great powers in international standard-setting, and by doing so, explore the current geopolitical power dynamics of the digital standard-setting domain.

To construct what is observed throughout the following analysis, it makes sense to employ an IR perspective, since it helps explore how policy makers (i.e., American, Chinese, and European ones) see the world (i.e., the digital standard-setting domain) and how this view influences their decision-making. In this specific case, a realist and a liberalist lens are appropriate because they allow for a perfect match with the juxtaposition of struggle for power *vis-à-vis* constructing consensus. Therefore, the theoretical contributions of Krasner (1991), Mattli and Büthe (2003), and Bishop (2015) constitute helpful foundations upon which the exploration of the geopolitical power dynamics of the digital standard-setting domain may build. However, since they do not constitute an ideal framework for which to study the phenomenon from an IR perspective, the following chapter sketches out a heuristic conceptual framework for which to capture the phenomenon appropriately.

4 Conceptual Framework

As established earlier, the objective of this paper is to explore the current geopolitical power dynamics within the digital standard-setting domain. As such, to begin with, a delineation of power is needed. Within this thesis project, the conception of power coincides with the amount of influence an actor wields in the system. In other words, it is about having the ability to influence, not the act of influencing itself. According to Holsti (1964), such influence "varies with (1) the type of goals an actor pursues, (2) the quality and quantity of capabilities (including allies and intangibles) at its disposal, (3) the skill in mobilizing these capabilities in support of the goals, and (4) the credibility of threats and rewards" (p. 188). Usually, influence on a global scale is reserved for great powers, which is why if the analyzed actors are in possession of given factors, they constitute what I coin a ***Great Digital Standard-Setting Power***. However, this thesis project is not only about showcasing who can wield influence, but rather explore what dynamics result from contextual and numerical variation of ambitions and capabilities respectively. To do that four concepts are employed.

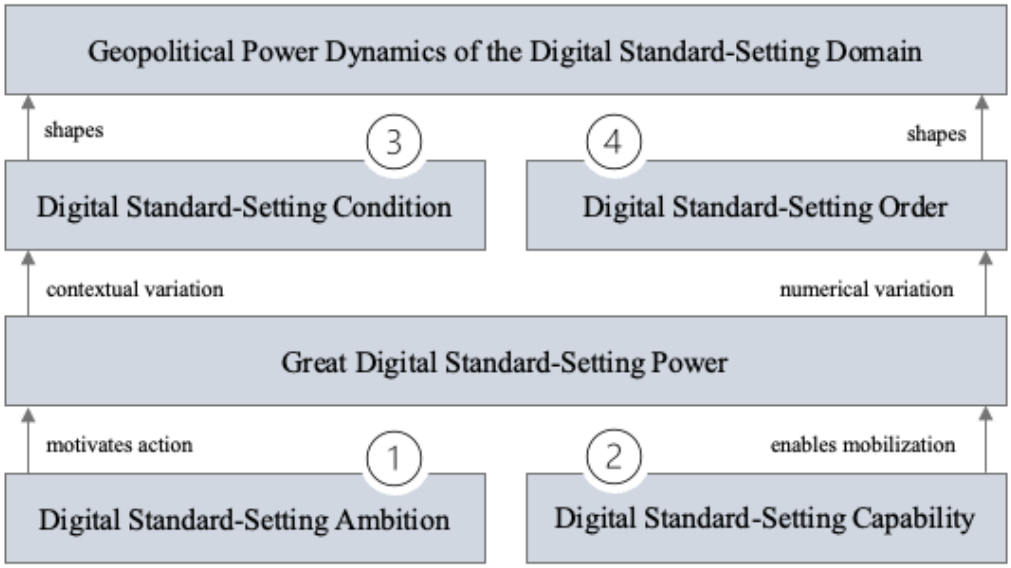

Figure 1: *Visualization of the Conceptual Framework*

The first concept, being digital standard-setting ambition, addresses the first factor of Holsti (1984). In this paper it will be used to sketch out the respective understandings (i.e., American, Chinese, and European) of digital standard-setting. The second concept, digital standard-setting capability, relates to the subsequent three factors of Holsti (1984), which will later be

employed to understand who can follow through on given ambition, or understanding. The third concept, that of digital standard-setting condition, seeks to define the current international approach to digital standard-setting with a juxtaposition of struggle for power *vis-à-vis* constructing consensus. Lastly, the concept of digital standard-setting order informs the power distribution in the digital standard-setting domain. To return to the *dictum* of power being the amount of influence an actor wields in the system, it is then necessary to understand how this system is understood before making any relevant claims about its power distribution. For the sake of argument, the following two opposing views are made use of.

4.1 Structural Realism vs. Liberal Institutionalism

Structural realism, or neo-realism, is a realist strand that stresses the undisputable presence of competition and conflict. It holds that the architecture (or the structure) of the international system guides the behavior of states, who are considered the main actors. According to neo-realist thought, the entire international system exists in accordance with an "ordering principle" (Waltz, 1979, p. 88). This ordering principle is known as the anarchic, decentralized nature of the international system, which cannot showcase an overarching, policing authority. This means that states must always be prepared to employ the use of force since they can never be sure of other states' intentions. Such a pessimistic worldview requires states to actuate self-help if they want to survive and thrive. Self-help can take the form of security maintenance, or power maximization. This variation exists because "states are alike in the tasks they face, though not in their abilities to perform them" (ibid., p. 96). Thus, states differ not in their function, but rather in their capability to perform said function. As such, neo-realists take on a very hierarchical view, which is why it is referred to as a top-down perspective.

Liberal institutionalism is a liberal strand that focuses on the possibilities of cooperation and collaboration. In contrast to neo-realism, the very core of the liberal institutionalist belief system is shaped by the assumption that the international system is a globalized, interdependent realm in which cooperation and collaboration between states is not only feasible, but also desirable to reduce the chances of competition and conflict. It does not focus on the question of "how fundamental common interests can be created among states" (Keohane, 1984, p. 6), but rather how cooperation is organized when such interests exist. Liberal institutionalists do not neglect the fact that states hold the ultimate power in the international system. Yet they recognize that international institutions (as the consequence of international regimes) have

become crucial in international governance. Especially in international standard-setting, they have reached the ability, from a liberal institutionalist's view, to shape the way states act in the international system. Thus, the liberal institutionalist view is more of a bottom-up perspective.

4.2 Digital Standard-Setting Ambition

The aim of the first explanatory factor is to investigate how the international digital standard-setting ambitions of China, the EU, and the US can be defined. As established earlier, power is influence. Since influence is "essentially a means to an end" (Holsti, 1964, p. 181), 'the type of goals an actor pursues' in the form of digital standard-setting strategies, as well as additional contextual information, of China, the EU, and the US are looked at in more detail. This is done to ascertain a comprehensive understanding on "how (concept or way) leadership will use the power (resources or means) available to the state to exercise control over sets of circumstances and geographic locations to achieve objectives (ends) in accordance with state policy" (Yarger, 2006, p. 6). This does not mean that the existence of digital standard-setting strategies necessarily assumes digital standard-setting ambitions – and *vice versa*. Rather the aim is to explore if the various approaches to digital-standard-setting are strategic in nature or not.

4.2.1 Protectionist Ambition

The first conception of digital standard-setting ambition is based on the notions brought afore by neorealists focusing on the defensive behavior of states. Its main proponent is Kenneth Waltz. He holds that states are essentially security maximizers. Defensive neorealists consider security plentiful. They believe that states constantly try to preserve the existing balance of power. In that sense, they promote defensive strategies because they consider offensive, competitive strategies counterintuitive. Thus, defensive neorealists consider states to be more secure within the international structure when maintaining the status quo (Waltz, 1979; Waltz, 2000). In the context of digital standard-setting, a defensive ambition equals the maintenance of the power distribution within the digital standard-setting domain. Based on previous chapters, the expectation is that American digital standard-setting ambitions showcase a defensive, protectionist touch.

4.2.2 Revisionist Ambition

The second conception of digital standard-setting ambition is based on the notions brought afore by neorealists emphasizing the offensive behavior of states. Its main proponent is John J. Mearsheimer. He holds that states are essentially power maximizers. Unlike defensive neorealists, offensive neorealists consider security scarce. They believe that states constantly try to increase their power to become superior to other actors in the system. In this sense, the odds of survival rest on the belief that power is the ultimate objective. The more powerful a state is, the less likely that less powerful states will challenge it. Unless a state is the absolute hegemon, it will never be satisfied with the existing distribution of power. Thus, the aim is predominantly to reshuffle the power dynamics (Mearsheimer, 2001). In the context of digital standard-setting, an offensive ambition equals the revision of the power distribution within the digital standard-setting domain. Based on previous chapters, the expectation is that Chinese digital standard-setting ambitions showcase an offensive, revisionist touch.

4.2.3 Symbiotic Ambition

The third conception of international digital standard-setting ambition is based on the notions brought afore by liberal institutionalists emphasizing the cooperative behavior of states. Its main proponent is Robert O. Keohane. Unlike neo-realists, liberal institutionalists reject the notion that cooperation is impossible with the absence of hegemony. Rather it argues that it can be facilitated by international regimes, which usually transform into international institutions after a certain amount of time. In fact, liberal institutionalists argue that international regimes can appear and thus facilitate cooperation when shared interests exist (Keohane, 1984). In the context of digital standard-setting, a symbiotic ambition then emphasizes the need for collaboration through international institutions, rather than conflictual behavior among states, to establish a digital standard-setting domain that is mutually beneficial for all the involved actors. The expectation is that European digital standard-setting ambitions showcase a symbiotic touch since the EU itself is an institutional construct.

4.3 Digital Standard-Setting Capability

To mobilize the digital standard-setting ambitions, a "base of capabilities" (Holsti, 1964, p. 181) in the form of digital standard-setting capabilities are needed. Again, the 'base of capabilities' is not "synonymous with the act of influencing" (ibid.). Rather, it represents the

instrument with which influence can be actuated. Based on this consideration, the aim of the second explanatory factor is to investigate who can internationally mobilize the given digital standard-setting ambitions. Consequently, the conception of digital standard-setting capability informs the (in)tangibles at disposal, but also the credibility and skill in mobilizing these capabilities in support of one's goals. To be clear about how findings on this oftentimes ambiguous term will be materialized, the following paragraphs will provide more detail.

On the one hand, the concept of capabilities is the sum of tangible and intangible factors. Normally, tangible factors can include aspects such as the state's wealth in terms of economic means, its level of industrial development, its possession of sophisticated weapons, or the size of its population. Intangible factors, on the other hand, constitute aspects such as leadership, or national morale (Holsti, 1964). In the specific context of digital standard-setting, therefore, tangible resources (i.e., quantity of capabilities) signify aspects such as formal digital standard-setting efforts (i.e., personnel participation, process participation, etc.), informal digital standard-setting efforts (i.e., *de facto* standard-setting, externalization of domestic digital standards, etc.), or the size of one's digital industry. However, "being a great power is not exclusively about passing a threshold of material resources" (De Keersmaeker, 2017, p. 31). Therefore, intangible resources (i.e., quality of capabilities) signify aspects such as one's reputation mirrored in the level of expertise brought afore in past digital standard-setting efforts, or one's domestic standard-setting structure.

On the other hand, what is crucial during the transformation of these digital standard-setting capabilities into influence, and thus power, is that they are mobilized in favor of one's own political purposes (Holsti, 1964, p. 185). In fact, "the use of capabilities depends less on their quality and quantity than on the external objectives that a government formulates for itself" (ibid.). Therefore, the capabilities are directly related to and intertwined with the previously thematized standard-setting ambitions. Yet, "the variety of foreign policy instruments available to a nation for influencing others is partly a function of the quantity and quality of capabilities" (ibid.). Against this backdrop, the digital standard-setting ambitions and the digital standard-setting capabilities evince a reciprocal relationship in that they mutually influence one another. Therefore, "how states use their capabilities depends on their external objectives, but the choice of objectives and the instruments to achieve those objectives are limited or influenced by the quality and quantity of available capabilities" (ibid.).

Moreover, it is important to consider that physical capabilities do not equal actual influence. This means that a capability "is always the capability to do something; its assessment, therefore, is most meaningful when carried on within a framework of certain goals and foreign policy objectives" (Holsti, 1964, p. 186). In other words, the measurement of capabilities is inherently connected with the indicator credibility. This means that the crucial aspect of a capability, in this case digital standard-setting capabilities, is not its possession, but the willingness to use it.

Based on the foregoing elaborations, the analytic approach can be pinned down as follows. Since the investigation and analysis of tangibles, within the context of the geopolitics of standards, experienced plentiful attention in the last couple of years (e.g., Creemers & Voo, 2021; Fägersten & Rühlig, 2019; He, 2022; Rühlig & ten Brink, 2021; Rühlig, 2022a), and the fact that this thesis project is, as later detailed, a qualitative endeavor, the focus will be on intangibles. Moreover, thematizing all tangible and intangible factors of digital standard-setting capabilities in the analysis would simply go beyond the scope of this thesis project. Since, as just established, mobilization and credibility are essential for the materialization of ambitions, one structural and one reputational intangible are chosen as subjects of inquiry. The structural factor is mirrored in the respective domestic standard-setting structures, whereas the reputational factor is mirrored in the level of expertise brought afore in past digital standard-setting efforts. The former factor will then be assessed in accordance with the notion of institutional complementarity, whereas the latter factor will just be qualitatively assessed in accordance with its level.

4.4 Digital Standard-Setting Condition

The third explanatory factor aims at understanding the current digital standard-setting condition. The conception of digital standard-setting condition holds that depending on the contextual variation (i.e., defensive, offensive, or symbiotic) within the ambitions of great digital standard-setting powers either a state of competition and thus an approach of struggle for power, or a state of cooperation and hence an approach of constructing consensus, can be showcased. To later delineate the digital standard-setting condition, the notions of a competitive (based on neo-realist assumptions) and a cooperative (based on liberal institutionalist assumptions) understanding of digital standard-setting are employed, and therefore will be outlined followingly.

4.4.1 Competition (Struggle for Power)

Usually, competition involves striving for relative success within some boundaries in the form of rules and norms. In the realist conception of the world, these boundaries do not exist since states engage in an arena that is inherently anarchic. Thus, international competition "involves the attempt to gain advantage, often relative to others believed to pose a challenge or threat" (Mazarr et al., 2018, p. 5). Consistent with this definition, the understanding of competition would presuppose that states compete "for narrow goals, such as the essential security of their nations" (ibid). However, according to Mazarr et al. (2018), also broader objectives can be subject to competition such as "the ability to influence or dictate outcomes" (p. 5). Since digital standards evince 'distributional consequences' and thus the power to 'dictate outcomes', they lead states to have an interest to set these digital standards. Therefore, it is expected that the current digital standard-setting condition showcases a struggle for power in that there are "fundamental disagreements over foreign policy objectives" (Holsti, 1964, p. 192) (i.e., in their digital standard-setting ambitions).

4.4.2 Cooperation (Constructing Consensus)

Unlike competition, cooperation seeks to achieve national security and prosperity through "mutual coordination of activities for common benefit" (Mazarr et al., 2018, p. 5). Thereby, it is important to distinguish cooperation from a mere "situation in which common interests outweigh conflicting ones" (Keohane, 1984, p. 12). Rather, its focus is on "mutual adjustment" (ibid.). As such, liberal institutionalists do not neglect the existence of "discord" (ibid.) The differing factor is that cooperation is the end-result of, unlike 'discord', successful attempts of increasing compatibility. Since international regimes reflect patterns of discord and cooperation, they are a crucial part in the conception of cooperation. In international standard-setting this international regime takes the form of consensus decision-making. Although this is the case, the strategic layer digital standards have attained, leads to an expectation of the current digital-standard-setting condition missing signs of constructing consensus in that "few disagreements over foreign policy objectives" (Holsti, 1964, p. 191) (i.e., in their digital standard-setting ambitions).

4.5 Digital Standard-Setting Order

Neither a realist worldview, nor a liberalist worldview regards the international power distribution to be equally proportioned. On the contrary, the international power distribution is constantly subject to fluctuating impacts, and thus changes over time. To be able to understand how power is distributed in the digital standard-setting domain, the concept of polarity will be used as an indicator. Thereby, the idea is not to investigate the ridge to which the power is balanced equally, but rather showcase how the digital standard-setting domain can be described based on the number of actors (i.e., numerical polarity) having the ability to wield influence in digital standard-setting (Waltz, 1979). Polarity then is about the numerical variation within the capabilities of the great digital standard-setting powers. Against this backdrop, the international power distribution is either grounded in unipolar, bipolar, or multipolar dynamics.

4.5.1 Unipolarity

A unipolar international system describes a condition in which one pole (or great digital standard-setting power) is significantly more powerful than any other actor. Thus, the power disparity is so big that an approximation in the sense of balancing power is non-sensical. In other words, the capabilities of the dominating power are too great to be counterbalanced, and thus the power does not face any immediate competitor. In the context of digital standard-setting this would mean that one pole (or great digital standard-setting power) is so much more powerful in the digital standard-setting domain that the other actors do not have the ability to wield influence. The expectation is that the digital standard-setting domain does not reflect said order.

4.5.2 Bipolarity

A bipolar international system describes a dynamic in which two poles (or great digital standard-setting powers) have a preponderance of power. Thus, all other actors are considerably less powerful, and international governance is led by the two dominating powers. Bipolarity is often associated with two opposing spheres of influence that bring afore respective alliance systems. The most prominent example being the Cold War. Neorealists consider the bipolar moment the most likely to guarantee stability. In the context of digital standard-setting this would mean that two poles (or great digital standard-setting powers) can wield influence

within the digital standard-setting domain. The expectation is that the digital standard-setting domain does not reflect said order.

4.5.3 Multipolarity

A multipolar international system describes a dynamic in which power is distributed among three or more poles (or great digital standard-setting powers). This means that the power disparity is less than in the other conditions. Neorealists are of the opinion that multipolar international systems are particularly prone to instability since the international interactions in a multipolar world are much more complex. In the context of digital standard-setting this would mean that three or more actors can wield influence in the digital standard-setting domain. Since the rise of Chinese influence in standard-setting, the expectation is that the digital standard-setting domain reflects said order.

5 Methodology

This chapter sketches out the methodological approach employed within this thesis project. Thereby, it is divided up into five sections. The first section provides an overview of the overall research design. The second section lays out the different research methods used within the context of this thesis project. Thereby, each subsection focuses on one specific research method separately discussing the rationale behind the choice of method, the data sources, the data collection process, and some method-specific problems and limitations. Thereafter, section three elaborates on the data analysis technique that was employed for the evaluation of all gathered data, across all research methods. To wind up the chapter, the overarching strengths and limitations of the research design are scrutinized in the fourth section, before some concluding remarks are made in section five.

5.1 Opening Remarks

In retrospect, this paper seeks to answer the following research question: *How are the geopolitical power dynamics within the digital standard-setting domain to be understood from an IR perspective?* This research question then follows one main objective, which is to provide an updated account, employing an IR lens, of the geopolitical power dynamics within the digital standard-setting domain. Thereby, the end-product aims at locating potential areas of contention, and power shifts within the landscape, its implications for the digital standard-setting condition, and the digital standard-setting order. To approach the end-goal in a systematic way, this thesis project employed a qualitative research design.

In contrast to a quantitative research design, which has a focus on measuring and counting things, the qualitative approach tries to "interpret the meanings that people bring to their own actions" (Payne & Payne, 2004, p. 176). These meanings are constituted by the qualities of the studied phenomena. Thereby, qualities refer to the "what, how, when, where and why of a thing" (Berg & Lune, 2017, p. 12). Accordingly, the explanatory factors found in the conceptual framework (i.e., digital standard-setting ambition, digital standard-setting capability, digital standard-setting condition, and digital standard-setting order) represent qualities that were able to be studied as "states of being, but not as precise and solid objects" (ibid.). In other words, the explanatory factors were real, fluctuating entities. Consequently, to understand these everchanging 'states of being', and provide a grounded, updated account of

the digital standard-setting domain, a qualitative research design was not only justified, but almost needed.

Apart from the qualitative nature of this thesis project, the focus was on exploratory knowledge generation. Along the previous chapters it became evident that the chosen topic is a rather new phenomenon. Thus, in terms of academic contributions, it is still under-researched and under-developed. Coupling this initial situation with the general interest of this project, signified in the research question and the research objective, and the fact that no preexisting paradigm was available as to study the phenomenon, meant that a research design geared towards an exploratory endeavor was required. This exploratory endeavor had its advantages. It was not only able to boil down the essence of a nebulous problem, being the geopolitical power dynamics within the international digital standard-setting arena but was also capable of doing it in a flexible, cost-effective, and open-ended manner. This was helpful considering the limited resources that were available – in terms of money and time.

To do the exploratory approach justice, a triangulation of methods was employed. Triangulation is nothing other than "a means of mutual confirmation and validation of findings" (Berg & Lune, 2017, p. 14). In other words, the research methods document analysis, web surveying and elite interviewing were employed to approach the same problemata and increase the trustworthiness of the research process and the final product. Moreover, by cross-checking the gathered data through the triangulation, a more comprehensive picture of the phenomenon developed. This meant that some of the flaws associated with single-method approaches, such as research biases, were circumvented. Another reason for which a triangulation of methods was appropriate, was the extensive conceptual framework. With four explanatory factors the conceptual framework was rather voluminous. The triangulation of methods allowed to gather relevant data efficiently, and thus shine a light on the issue in a suitable way.

However, it must be stated that the efficient data gathering was heavily assisted by the purposive, non-probability form of sampling, which was employed for all data collection methods – though with slight variations. The judgmental purposive sampling technique was highly beneficial because it sampled deliberately so those sampled were relevant to the research question (Bryman, 2016). In short, this thesis project employed a qualitative research design with a triangulation of methods, which was geared towards exploratory knowledge generation due to the previously little-researched matter at hand.

5.2 Data Collection

As stated, this thesis project worked with a triangulation of methods including a document analysis, a web survey, and elite interviews, which will be followingly, separately presented.

5.2.1 Document Analysis

A document analysis is essentially a "systematic procedure for reviewing or evaluating documents" (Bowen, 2009, p. 27). The rationale for choosing this data collection method was to establish a grounded basis for this thesis project. Thereby, the advantages were manifold. For instance, the document analysis is oftentimes used as a "complement to other research methods" (ibid., p. 29). Thus, it provided a strength in that it was able to collaborate with other data collection methods. Considering this thesis project employed a triangulation of methods, this ability was significant.

Another advantage was constituted in the qualities that made the conduct of a document analysis, within the confines of this thesis project, practical. For instance, the documents provided context information and "supplementary" (Bowen, 2009, p. 30) data. Since this project, *inter alia*, aimed at giving an insight into the digital standard-setting ambitions of China, the EU, and the US, it was vital to sketch out a baseline that presented context and understanding of these ambitions. Moreover, this information led to useful questions to be asked during the preparation of the survey questionnaire, and the guide for the elite interviews. Not to mention is the fact that the document analysis proved to be an efficient, cost-effective, stable, and exact approach that was not affected by the research process.

The most important advantage, however, was public availability because it simplified the sampling process. In fact, all sample units were sourced from the web leading to an array of empirical material of two distinct categories. A first data source that was used in the context of this thesis project was primary in the form of "official documents deriving from the state" (Bryman, 2016, p. 552). These included official American, Chinese, and European documents. Since such documents contain crucial first-hand information, they provide a rewarding basis for any qualitative study in the field of IR. As such, according to Burnham et al. (2008), a serious researcher would want to work with as many primary sources as possible. This would have been possible as most 'official documents' are published online.

However, single-handedly analyzing every single document deriving from states associated with the matter at hand would have exceeded the scope of this thesis project.

To avoid this problemata, also secondary data sources in the form of "official documents deriving from private sources" (Bryman, 2016, p. 553) were collected. These included documents such as reports, research papers, or white papers produced by institutions such as think thanks, research institutes and universities, consulting firms, and foundations. These documents were certainly valuable when context information had to be gathered and proved to be an auxiliary instrument in terms of mapping a consensus, avoiding the risk of duplication, and increasing efficiency.

During the collection process, the official state and private source documents were assessed in accordance with the quality criteria of Scott (1990): authenticity, meaning, credibility, and representativeness. First, authenticity analyzes "whether it [the document] is actually what it purports to be" (ibid., p. 19). Public records in the form of official state documents were not hard to authenticate. A sound analysis of the authorship detected the genuineness of the documents in question. However, authenticity became a bit more intricate when it concerned private source documents, which is why only private source documents were gathered that were published by reliable sources – e.g., renowned think thanks.

Second, the criterion meaning refers to the composition and comprehensiveness of a document (Scott, 1990). Since this project did not investigate historical, but rather recently published official state documents, there was little to no issue in establishing the literal meaning of English documents. Chinese documents, however, were oftentimes not translated directly to English. For these documents, a trustworthy translation was sought. If none was available, the documents were translated using the web service DeepL. For reasons of transparency, all instances, in which a quote from such a translation was used, were marked appropriately.

Moreover, as Burnham et al. (2008) rightly point out, "problems of interpretation" (p. 212) can emerge in relation to the meaning of a document, requiring a researcher to get as much background and context information as possible. This fact was another reason for the combination of official state and private source documents. In that sense, the official private source documents, rich in contextual and background information, acted as a safety mechanism against the potential limitation of interpretative difficulties when analyzing said documents.

Third, the credibility of official documents is established through their accuracy (Scott, 1990). Here it became a bit more complicated. Since the investigated official documents differed in terms of their authorship, they also differed in terms of values and interests underlying the document. Thus, the level of distortion was not necessarily the same. On the contrary, it strongly depended on who produced and published the document. As such, the official documents could not be taken as "depictions of reality" (Bryman, 2016, p. 553). This potential limitation was not taken light-heartedly but was carefully considered and reviewed.[5]

At last, representativeness questions whether the consulted documents are "representative of the totality of relevant documents" (Scott, 1990, p. 24). Generally spoken, representativeness was not that meaningful in this case because qualitative work cannot be representative in a statistical sense. However, more intricate considerations can be made. Scott (1990) divides the criterion representativeness into two parts: "survival" (ibid., p. 24) and "availability" (ibid.). Since all the documents were collected online, the tenet of survival was taken for granted. As people have generally got to peace with the idea that once something is on the internet, it will always be there, a digital permanence of some sorts, the survival of official documents published online was assured.

However, the problem of availability was pressing since not all surviving documents were conveniently accessible. For example, Chinese official state and private source documents were sometimes hard to obtain. This unavailability of documents, or "low retrievability" (Bowen, 2009, p. 32) certainly presented a limitation during the research process of this thesis project. Yet, it was not the only limitation associated with document analysis that presented a risk for this thesis project. The issue of "biased selectivity" (ibid.) and the problem of ending up with insufficient details constituted two additional limitations. To steer against those, and thereby mitigate an "over-reliance on documents" (ibid., p. 29), a web survey, and elite interviews were administered.

5.2.2 Web Survey

The second research method employed within the context of this thesis project was a web survey. The web survey is a data collection method that is low-cost, self-administered, and geographically flexible (Callegaro et al., 2015). Although these advantages already made for

[5] For a full overview and classification of documents and reports collected and analyzed refer to appendix A.

an approachable tool, the rationale for choosing the web survey within the confines of this project was another. For instance, the ability of web surveys to produce quasi-quantification was sought. Specifically, quantitative strands were brought into the project in accordance with the idea that "most research does not fit clearly into one category [quantitative] or the other [qualitative]" (King et al., 1994, p. 5), but "the best often combines features of each" (ibid.). This meant that the web survey was chosen to avoid having to rest purely on anecdotalist data.

Akin to the previous research method, expert sampling was employed under the broader umbrella of the purposive approach. This approach enabled to sample "based on lists collected by self-selection" (Callegaro et al., 2015, p. 8). The main reason for this choice was simple: Expert sampling is oftentimes used in exploratory research when new areas of research are investigated. Since the topic of this project was very specific and the academic literature was not well-researched yet, experts were needed with demonstrable knowledge, or experience on the matter at hand. Expert sampling enabled to produce a sample that guaranteed this characteristic. Throughout the process, a contingent approach was administered so that the sampling units could evolve over time. For instance, when previously unknown experts were encountered, they were continuously added to the expert roster.

Once the first version of the sample was in place, the survey questionnaire was sketched out. It consisted of a total of 20 questions. 10 of which were close-ended, Likert Scale (LS) questions, and 10 of which were open-ended, standard text-field questions. The former type was used to measure the experts' opinions on the matter at hand. Thereby, a typical five-level format was employed: strongly disagree, disagree, neutral, agree, and strongly agree. The latter type was mainly worded in the form of specifying questions, which were always asked immediately after and in relation to LS questions. This type was employed to receive more specific information to the more generalized LS questions.

It must be noted though that the survey questionnaire was produced at a point in time at which the thesis project was still at a premature state. Thus, some concepts within the questionnaire evolved throughout the research and turned out slightly different in the end-product. For example, the concept of digital standard-setting strategy was translated into digital standard-setting ambition. This was done to ensure that a broader aspiration could be captured, rather than only the strategy as an instrument on how to achieve interests. Another explanatory factor that experienced such a transformation was the digital standard-setting competition. During the

thesis project uncertainties arose about the existence of a digital standard-setting competition and thus was changed to standard-setting condition.

The data was collected using a web-based application over two months' time. Specifically, Microsoft Forms was employed. The service was provided by the university for free, and since all the basic features needed for the conduct of the survey were available on this application, a subscription-based service was not needed. This format was applied over two months – the entire December and January. The initial idea was to only run it in December. Due to a low response rate the timeframe had to be extended.

The web survey was sent out to selected experts per e-mail. If no e-mail was available, they were contacted via LinkedIn. In a first instalment, in the beginning of December, the survey was sent out to 56 people. In a second instalment, towards the end of December, another six people were contacted. In a third instalment, in the beginning of January, the survey was sent to the last 19 people. Thus, a total of 81 people were contacted. All experts were reminded twice, meaning that everybody that was contacted by e-mail received the invitation at least three times. This proved to be useful because lots of experts only reacted upon the last reminder. In the case of two people, the e-mail did not go through due to an unserviceable address. From all the other e-mails, 24 people participated in the survey. All the experts that were contacted via LinkedIn, five to be precise, did not answer. Consequently, the response rate recorded a mere 19.44 %, which can be partially indebted to the holidays (i.e., Christmas, New Year, and Chinese New Year).

Limitations of the web survey were brough afore through its needed time for completion, and the sampling for participants. On the one hand, the average time of completion was rather long, which hindered some experts to participate in the survey. The online generated average time of completion evinced 52 minutes and 12 seconds. However, this number was corrupted. The longest time of completion was over 300 minutes, whereas the shortest time of completion was just over 6 minutes, which seemed to be indebted to the web-based nature of the survey. For instance, since the survey was self-administered, participants did not necessarily have to complete the survey in one stretch. If participants were interrupted during the survey, the web tab could have been kept open, while the timer continued running. This observation is underpinned by the fact that most participants took in between 15 and 30 minutes to complete

the survey, which was still considered rather long by experts. This seems to indicate that a shorter survey would have increased the response rate.

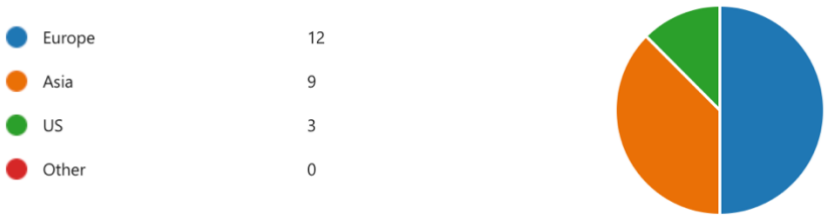

Figure 2: *Web Survey Insight on the Locations of Participants*

On the other hand, a more concerning limitation of the web survey presented itself within the sampling of participants. Although sample units were selected based on their expertise, the representation of various geographical areas (i.e., Asia, Europe, and the US) and various affiliations (e.g., industry experts, researchers, private company employees, or government employees) was also sought to achieve. As figure 2 indicates, this ambition proved to be difficult. The level of representativeness of the web survey was not ideal, which posed a risk of being a "source of bias and inaccuracy" (Burnham et al., 2008, p. 108). To steer against this limitation, the elite interviewing method was planned in a way that guaranteed higher diversity.

5.2.3 Elite Interviews

Elite interviewing was the third research method employed within the context of this thesis project. As its name suggests, it has one distinct peculiarity, which, when carried out correctly, makes "a considerable contribution to the understanding of political phenomena" (Burnham et al., 2008, p. 231). While qualitative interviewing in a more general sense tries to "understand the world from the subjects' point of view" (Kvale & Brinkmann, 2009, p. 1), elite interviewing attempts to grasp a particular phenomenon from an elite's (i.e., an expert) perspective since it acquires "information and context that only that person can provide about some event or process" (Hochschild, 2009, p. 124). However, the reason why elite interviewing was particularly suited to this thesis project, and why it was chosen in the first place, was its ability to "make sense of what has been gleaned from those [previously employed] strategies [research methods]" (ibid., p. 127).

Akin to the previous research method, sampling was based on a contingent expert approach. However, it was significantly easier since potential interviewees were mainly selected from the

participants of the web survey. Thereby, they were "chosen by name or position for a particular reason" (Hochschild, 2009, p. 124). This 'particular reason' was their expertise on the matter at hand. In fact, the survey participants with the most immediate knowledge of the topic were asked to participate in the interviews. To avoid a biased participant panel, experts from different geographical areas, and from different affiliations were chosen. In some instances, experts were asked to participate in the elite interviews that did not contribute to the web survey – this was only done if an expert had particularly strong expertise, and thus was crucial to interview.

The selected experts were invited through follow-up e-mails to the web survey. A total of 11 experts were invited. Three selected experts did not respond, and one expert was not able to make time for an interview. As a result, seven experts signaled their willingness to participate in the elite interviews. Once that was the case, a date and time was agreed upon in either week number five (i.e., January 30th, 2023, until February 2nd, 2023), or week number six (i.e., February 6th, until February 12th, 2023). Simultaneously, the participants were informed that the interviews would be recorded and were given the opportunity to object if they wished not to be – none appealed.

Although every Elite Interviewee (EI) was informed about the recording beforehand, the EI was asked for consent again at the beginning of each session. If an agreement was reached, the interviews were recorded within the videoconferencing service Zoom. Since the interviews were conducted online, Zoom acted as the videoconference service of choice. Obviously, because it allowed to record the interviews, but also because the participants did not need to have Zoom downloaded as an application. Instead, it worked in any web browser. Moreover, the meetings were like in-person interviews in that those involved were able to visually see one another and low-cost in terms of time and financial resources. For instance, since the experts were distributed along all the geographical regions covered in this thesis project, conducting the interviews on site, would have been expensive and time-consuming.

Additionally, it is important to note that the approach was not chosen to mirror the web survey's focus on standardization. Rather the aim was to showcase a systematic approach to increase the trustworthiness of the thesis project and strengthen my trustworthiness as a researcher. However, employing a systematic approach did not mean that the very strength of qualitative interviewing (i.e., flexibility) was abandoned. For instance, elite interviewing, in this specific

case, focused on retrieving the peculiarities found in opinions of experts in an unstandardized manner. This unstandardized manner took the form of semi-structured interviews.

The semi-structured interview is a form of interviewing that is guided by "a list of questions or fairly specific topics to be covered" (Bryman, 2016, p. 486), which is fine-tuned for each participant considering their position and background. Hence, this form of interviewing is predetermined only to a certain extent. Thereby, semi-structured interviews provide the ability to gather new, or unexpected information, whereby the researcher is encouraged to dig deeper when interesting statements were made by the participants or follow up on any uncertainties. Thus, semi-structured interviews are ultimately flexible in nature. Nonetheless, the baseline is constituted by previously gathered knowledge, in this case, through the literature review, the conceptual framework, the document analysis, and the web survey.

Seven interviews were conducted that lasted in between 30 minutes and one hour. For most of the interviews, no technological issues came up. During one of the interviews slight connection issues emerged, which however did not impact the recording. The questions posed were mostly direct and indirect questions. Yet, during the interviews, follow-up, interpreting, and specifying questions were also employed. As touched upon before, this helped to follow up on the participants' statements, boil down a general description made by the participants, or get an interpretation on a specific topic, as well as guaranteeing richness of information in the responses of experts.

Once all the interviews were done, they were transcribed using Microsoft Word in accordance with intelligent verbatim transcription. Within the web-version of Microsoft Word, there is a feature that automatically transcribes an uploaded audio file. Since all the interviews were recorded, such an audio file was available. This shortened the transcription process extremely. If the transcription process normally requires five to six hours of work for every hour of speech, this feature shortened the process down to less than two hours for every hour of speech (Bryman, 2016).

The only thing that had to be done is go over the transcribed text and identify instances that were transcribed incorrectly and actuate the intelligent verbatim approach – i.e., delete any irrelevant filters like 'uhm', 'you know', or 'yeah'. Thus, the Zoom recordings were essential in relation to the transcription of elite interviews. However, they were not only invaluable

because they provided audio files that could be uploaded to Microsoft Word, but also to run back the respective interviews and be very precise with quoting what has been said, when some excerpts were transcribed incorrectly. The outcome were transcripts that structured "the interview conversations in a form amenable to closer analysis" (Kvale & Brinkmann, 2009, p. 180).

5.3 Data Analysis

The empirical material gathered from the document analysis, the web survey, and the elite interviews was assessed using a QCA. The QCA is a "careful, detailed, systematic examination and interpretation of a particular body of material in an effort to identify patterns, themes, assumptions, and meanings" (Berg & Lune, 2017, p. 182). Within the confines of this thesis project, the QCA was guided by the explanatory factors (i.e., the concepts) found in the conceptual framework. To ensure a systematic examination of the gathered empirical material, the QCA was divided up into three parts.

Firstly, codes were developed for an efficient conduct of the QCA. Generally, "coding organizes and conceptualizes the detailed components of data into patterns, by use of symbols and labels to identify […] elements that will feature in the analysis" (Payne & Payne, 2004, p. 36). More specifically, two approaches were employed: the conventional, and the directed (Hsieh & Shannon, 2005). Since, on the one hand, the conventional approach derives codes directly from the raw data itself, it provided the flexibility to add previously unconsidered layers to the subject of investigation, whereas, on the other hand, the theoretical or conceptual framework was validated by the directive approach. This "deductive application of categories" (Mayring, 2000, p.1) was crucial as, with the previously built conceptual framework, a clear vision of what to filter out was already existent.

Secondly, these codes were brought into connection with the empirical material. The official state and private source documents, the data from the web survey, and the transcripts from the elite interviews were all sorted and examined carefully. This process was important because it acted as somewhat of a noise filter, meaning that unimportant aspects to the matter at hand were screened out. Simultaneously, interesting, and meaningful excerpts were highlighted. Since the volume of text data was not enormous, a QCA by hand was actuated. The rationale

behind this choice was the belief that an efficient and systemic analysis of the amassed data was also doable without a computer-assisted approach.

Lastly, identified patterns, or meanings were presented as findings. The presentation of findings followed the principle of "thick description" (Bryman, 2016) (p. 697), which signifies "detailed accounts of a social setting that can form the basis for the creation of general statements" (ibid.). In the context of this thesis project, thick descriptions made the explanatory factors graspable. Thus, it enabled to provide an in-depth understanding of what the current geopolitical power dynamics within the digital standard-setting domain are.

5.4 Strengths and Limitations

Specific strengths and limitations associated with the respective employed research methods, were addressed in previous paragraphs. The overarching strengths and limitations that concern the entire research design, are followingly assessed in accordance with the alternative quality criteria of Lincoln and Guba (1985). They consider the appropriate way of assessing qualitative research an employment of four aspects that collectively determine the trustworthiness of an academic paper: credibility, transferability, dependability, and confirmability.

First, credibility asks whether the findings are accurate. It analyzes if a sound argumentation is present and ultimately decides if a study is credible to others (Bryman, 2016). Therefore, this quality criterion strongly relates to the credibility of the researcher, and the employed research methods. As established earlier, the main instrument that was employed to achieve credibility was the triangulation of methods. The act of combining a document analysis, a web survey and elite interviews to present findings that underpinned the argumentation certainly strengthened this thesis project. Moreover, the systematic and organized procedure, that was employed over the course of the research process, and the production of this paper was an attempt at establishing credibility of the researcher.

Second, transferability refers to "the degree to which findings are generalized across social settings" (Bryman, 2016, p. 384). Thus, transferability is associated with generalizability and asks if the findings are applicable within other contexts. Generally, it can be said that qualitative studies, and especially explorative studies have a hard time to prove means of generalization. However, to steer against this limitation, thick descriptions were made use of as much as

possible – within this chapter to describe the data sampling, data collection, and data analysis process in detail, as well as in the results chapter to provide the contextual understanding with substantial backing.

Third, dependability questions the replicability of findings (Lincoln & Guba, 1985). The subject of interest is consistency, as well as reliability. It demands the creation of an audit trail to trace how the research was done and thus guarantee its quality. Generally, it can be said that little standard procedures are employed in qualitative research. In the specific context of this thesis project, this rings true as well, despite the systematic approach that was displayed. For instance, an attempt was made to describe the research as clear as possible by meticulously describing all the steps taken throughout the research process. However, realistically, an exact replication of this thesis project is hardly possible considering all the variables that were at play, and the fact that little standard procedures were employed.

At last, confirmability pins down objectivity. Hence, objectivity holds that "researchers should remain distanced from what they study so findings depend on the nature of what was studied" (Payne & Payne, 2004, p. 152). Ultimately, it is key that the researcher can be said to have acted in good faith, although it is evident that complete objectivity is an unattainable goal. The risk of bias is always imminent in qualitative research. To mitigate it at least a little, the triangulation of methods was employed. Moreover, I tried to keep my role in the research as objective as possible. Especially, when my opinions could have subconsciously entered the paper: while preparing questions for the web survey, while asking questions during the elite interviews, or while discussing the results. In essence, an effort was made to commit to the gathered data so that it could speak for itself.

Apart from the trustworthiness of the thesis project, there are ethical aspects worth considering as well. According to Bryman (2016), there are four: "whether there is harm to participants" (ibid., p. 125), "whether there is a lack of informed consent" (ibid.), "whether there is an invasion of privacy" (ibid.), and "whether deception was involved" (ibid.). Within the confines of this thesis project, two ethical aspects took center stage. On the one hand, it concerned informed consent. For instance, all people that were involved at any point in time throughout the research process, were given information about the thesis project, on how the data was going to be used, and how long it would be stored. The opportunity to voice concerns was always given. On the other hand, it concerned confidentiality and anonymity. When people

were involved in the thesis project, they were always given the opportunity to stay anonymous if desired. For reasons of uniformity, when quoted, all participants are referred to in an anonymous manner.

5.5 Closing Considerations

To conclude this chapter, it can be said, that the explorative approach was flexible during the research process, helpful in narrowing down a little researched phenomenon, as well as thinking open-ended in relation to the outcome of the thesis project. However, the exploratory approach also had its weaknesses. For one, this open-ended nature made it hard to showcase conclusive results. More importantly though, the fact that no existing paradigm was available as to which to approach the phenomenon made the research process very labor-intensive.

To circumvent these limitations, countermeasures were taken where possible. Many of them were discussed in the previous subchapters. For some issues, however, there was just no antidote. For instance, the Chinese language barrier aggravated this thesis project. On the one hand, it limited my ability of scouting for experts. Although lots of universities had English webpages, where experts could be found, industry companies, or Chinese think thanks often did not. If English webpages were available, usually they did not carry all the information. What made this fact even harder, was that contact information was hardly ever available. On the other hand, it made document research very tough. Most Chinese state documents were not translated to English. Thus, it was hard, as a non-Chinese speaker, to sift through Chinese documents. These reflections meant that my inability to read and speak Chinese constituted a major limitation, and thus, I must acknowledge, that this paper is most certainly biased towards a Western perspective.

In any case, as King et al. (1994) correctly point out: “Science at its best is a social enterprise” (p. 9). This means that “every researcher […] labors under limitations of knowledge and insight, and mistakes are unavoidable” (ibid.). By quoting this excerpt, I recognize that my work is not perfect under any circumstance. However, I can wholeheartedly guarantee that I acted in good faith in all steps of the research process, and that I tried, considering the available resources, to employ and present my research design as thoroughly and systematically as I could.

6 Ambitions, Capabilities, and the *Status Quo* of Digital Standard-Setting

Retrospectively, the fact that the digital domain, according to one Web Survey Respondent (WSR), "offers new possibilities, which may not exist in the non-digital domain" (WSR 21), has catapulted digital standards to the very forefront of the race to technological superiority. As a matter of fact, digital standards meanwhile bear significant weight. This assumption is underpinned by data gathered from the administered web survey. As figure 3 indicates, nearly all WSRs believed digital standards to carry a transformative force (LS 1). To be more specific, 62.5% agreed with the visible statement, 29.2% strongly agreed, and a mere 8.3% remained neutral.

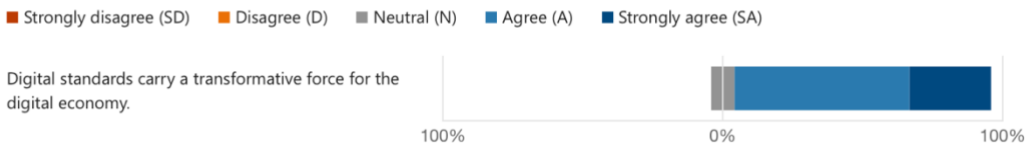

Figure 3: *Web Survey Insight on the Transformative Force of Digital Standards*

To explore what said force signifies and triggers in respect to ambitions, capabilities, and the *status quo* of the digital standard-setting domain, followingly the data gathered from the document analysis, the web survey, and the elite interviews is presented.[6] Thereby, the chapter is divided up into five sections. The first three thematize the respective digital standard-setting strategies, and intangibles of China, the EU, and the US to bring afore their digital standard-setting ambitions, and capabilities. The fourth section delves deeper into the digital standard-setting condition, whereas the last section concludes the chapter by giving an overview of its order.

6.1 Striving for Chinese Achievement

The constantly evolving, and little standardized nature of digital nascent technologies and its associated digital domain have, up until now, constituted a void in the international standard-setting arena, and attracted interest, *inter alia*, by China. This is what led most of the WSRs to believe that the digital domain posed the greatest potential for China in terms of standard-

[6] As a reference, an overview of the analyzed official and private source documents, the administered web survey questionnaire, and the employed elite interview guide can be found in the appendices A, B, and C respectively.

setting capabilities (LS 18a). In fact, digital standard-setting being "critical for China" (WSR 1) was a common view among WSRs. Coupling this inception point with the reality of digital standards having a transformative force, and 'distributional consequences' – which assumed a pivotal role in deciding who ascends successful in the conquest for the 4IR – make of the digital domain an avid avenue to pursue for great powers with technological aspirations. Especially, China showcased willingness to capture said force, and shape said consequences to excel in the digital domain (de La Bruyère, 2021b; de La Bruyère, 2022). In other words, China is trying to fill the void in the international standard-setting arena, constituted by the digital domain, with Chinese-made digital standards.

The Chinese government is advancing this aspiration, so the results suggested, with a concerted approach. Already in its "National Medium- and Long-Term Program for Science and Technology Development (2006-2020)" (The State Council of the PRC, 2006), the Chinese government declared it wanted to "take an active part in international efforts for standards development and strive to make our country's [Chinese] technology standards international standards" (ibid., p. 48). This aspiration was stated in relation to a "technology standards strategy" (ibid., p. 47), which assumed one part of the dual-track approach to promote 'indigenous innovation' in the context of Chinese technology. These aspirations were explicated in 'Made in China 2025' and later reinforced throughout the "13th Five-Year Plan (2016-2020)" (CCTB, 2016), and the "14th Five-Year Plan (2021-2025)" (Xinhua News Agency, 2021b).

This "deliberate and strategic lineage" (de La Bruyère & Picarsic, 2020, p. 5) towards digital standard-setting was furthered when the two-year 'China Standards 2035' research project was launched by the Standardization Administration of China (SAC) in 2018 as a "successor and amplification" (ibid.) of 'Made in China 2025' and announced as a "forward-looking and strategic research program" (SAC, 2022). In that regard, if 'Made in China 2025' was about controlling "the production of the world's goods" (de La Bruyère & Picarsic, 2020, p. 5), 'China Standards 2035' was about governing "the systems according to which goods are made and transactions flow" (ibid.). Therefore, it was pinned down as a "deliberate" (ibid.) plan with the aim of establishing global rules "especially in emerging technologies" (ibid.).

Moreover, the overarchingly strategic Chinese approach towards digital standard-setting and the intention to "proliferate standards internationally" (de La Bruyère & Picarsic, 2020, p. 11)

became even clearer in the "Main Points of National Standardization Work in 2020" (SAC, 2020) – a follow-up document to the government-led 'China Standards 2035' research project. As a matter of fact, the SAC stated that it would "strengthen the top-level design and enhance the strategic position of standardization" (ibid., p. 2), as well as "participate in the governance of international standards and raise the level of internationalization of standards" (ibid., p. 10-11).

Later, the focus on the importance of nascent digital technologies and its standard-setting gained renewed attention in the most recent published official Chinese document – the "National Standardization Development Outline" (Xinhua News Agency, 2021a). Indeed, the first of seven key missions within the outline was "the promotion of interactive development between standardization and S&T [science and technology] innovation" (ibid., p. 3), which concretely meant, *inter alia*, the strengthening of "key technical fields" (ibid.) such as AI, quantum, and biotechnology. At the same time, according to Wei (2022), one of the two main features of the 'National Standardization Development Outline' was the "expansion of roles" (p. 5) – i.e., being a strategic layer. By quoting Wu Hequan, Chairman of the China Standardization Special Committee, Wei (2022) stated that the outline "contributed to significantly boosting the strategic positioning of standards, which can be regarded as milestones in our [Chinese] national standardization activities" (p. 5).

The findings from the web survey were in line with these elaborations in that they showcased a belief about an inherently strategic Chinese digital standard-setting approach. As a matter of fact, when asked about its standard-setting agenda, all WSRs believed that China was advancing a strategic one (LS 3a). In terms of this strategic standard-setting agenda targeting emerging and digital technologies, the outcome was similar (LS 3e). 95.8% believed said targeting to be the case, whereof 62.5% agreed and 33.3% strongly agreed. To strengthen the rationale of choice, one respondent wrote that China was "committed to use standardization as a strategic tool for strengthening competitiveness" (WSR 10), whereas another stated that China "moved much earlier to elevate technical standardization to national strategy and has embraced an approach where the state has a much more prominent role" (WSR 14).

As a matter of fact, up until now, Chinese efforts in digital standard-setting have been actuated through a government-directed structure. In that sense, the Chinese agenda has been "set under the leadership of the state" (WSR 20) in "a degree of top-down, state-directed standard-setting"

(WSR 9). Thereby, the development and coordination of standards is assigned to the SAC, "which lies under the State Administration for Market Regulation […], an arm of the State Council" (Seaman, 2020, p. 11). Since China views "technical standard-setting as a component of a broader strategic agenda" (WSR 23), a WSR suggested, China has been "advancing and defending […] own industrial and commercial interests, seeking a level of economic resilience, and advancing values" (ibid.) with the help of "greater state intervention" (WSR 15) and support in a "sovereignty-oriented" (WSR 18) manner. Seaman (2020, p. 11) summarized it appropriately:

> *"Because of the central role played by the party-state in China, the country's standardization strategies are considered as a function of established political priorities rather than solely driven by technical and business considerations."*

Against this backdrop, the Chinese approach to digital standard-setting has been comprehensive in that it functioned in concert with its industrial policy. In fact, the major Chinese differentiator has always been a "more state-driven industrial policy" (Creemers & Voo, 2021, p. 5), which included "ambitions in the realm of standards" (ibid.). Meanwhile, the Chinese government plays a major role in digital standard-setting activities and can "leverage representation in SDOs in a way that other national governments cannot" (de La Bruyère, 2022, p. 59). With state-owned companies, this process obviously is direct. For example, as of 2022, 60% of 3GPP chairs and vice chairs in open working groups affiliated with Chinese entities were state-owned (ibid.). Regarding non-state-owned companies, standard-setting benefitted "from government subsidies or funding arrangements" (Seaman, 2020, p. 12) to assure a concerted approach in line with industrial policy and promote 'indigenous innovation' on all levels.

This concerted approach was crucial in terms of catching up to the West, yet the Chinese government has been planning and implementing a reorganization of its domestic standard-setting structure over the last couple of years. The majority of WSRs believed that China's coordinated approach to DSS in that it was able to move as a bloc strengthen its standard-setting capabilities (LS 14b). However, in the 'National Standardization Development Outline' the Chinese government declared it would change the supply of standards "from government-led to government and marked-oriented" (Xinhua News Agency, 2021a, p. 2) by 2025. Although this shift already started in 2017 with the Chinese standardization reform, the

renewed willingness to revise its "top-down government-centered standardization system" (Wang & Liang, 2016, p. 1), which was instrumental in China's "catch-up position" (EI 1), indicated a transition from a solely state-directed standard-setting approach towards increased industry participation, which has been referred to as the "upgrading stage" (Yang et al., 2022, p. 4). Another important aspect of this 'upgrading stage' has now become an enhancement of digital standard-setting output in terms of quality.

In 2020, Zhang Xiaogang, former chair of ISO, declared that "all countries around the world recognized that China had, over the past five years, made the largest contributions to international standardization" (SESEC, 2020). However, the findings suggested that this contribution was large in terms of quantity, but not quality. Throughout the catch-up phase, Chinese stakeholders were incentivized to develop standards based on a reward system of "quantity over quality, or effort over outcome" (Creemers & Voo, 2021, p. 6). One elite interviewee described it as a way of entering "everywhere and betting on all horses with the belief that one will win" (EI 4). The web survey results underpinned this with Chinese standard-setting described time and time again, as "quantity over quality" (e.g., WSR 9).

However, given characterization meant that the Chinese "impact [in standard-setting] has not been major" (WSR 9) and had "a lot of failures as well" (EI 5). The fact that Chinese standard-setting participants "showed up to a lot of meetings with suboptimal standards and things that did not make sense" (ibid.) was "not necessarily helpful to their credibility" (ibid.). Therefore, the Chinese government announced, in the 'National Standardization Development Outline', that "the development of standardization will be changed from quantitative scale model to quality and efficiency" (Xinhua News Agency, 2021a, p. 2) by 2025.

The results evinced no clear verdict on how these aspirations materialized, and it would be better served to analyze these after 2025 anyways. What can be said in relation to the findings though, is that China has recognized the value of digital standards and although "international participants in SDOs continue to see quality issues preventing a stronger Chinese influence, they also consistently acknowledge that China improves" (Rühlig, 2022a, p. 6). As a matter of fact, one elite interviewee stated that "the [China's] quality is becoming better" (EI 4). Moreover, in a 2019 interview with a senior representative of a European standardization organization, Rühlig (2022a, p. 7) was given an interesting insight:

> *"To this day, many Chinese proposals are rejected because of their technological quality is inferior to the contributions of other experts. Regardless of these continuous challenges, you cannot ignore the improvements. The time when some of my colleagues would not take Chinese contributions seriously are gone."*

The findings of this thesis project even went one step further and suggested that the Chinese digital standard-setting strategy aimed at fundamentally remodeling the *status quo*. As a matter of fact, the web survey results showed that 75% of the WSRs believed that with increasing standard-setting capabilities, China would aim at remodeling the global standard-setting order for the digital domain (LS 15d). Thereby, 54.2% agreed, whereas 20.8% strongly agreed. In line with these results, most WSRs did not believe that despite increasing standard-setting capabilities, China would have no interest in fundamentally remodeling the global standard-setting order for the digital domain (LS 15e). To be more specific, 33.3 % disagreed, whereas 37.5% strongly disagreed. One WSR explicated that China was "trying to influence the system in a concerted and coordinated way, which raises concerns about the governance and integrity of the system to develop voluntary, industry-led, and high-quality standards" (WSR 9).

Contrary to the web survey data, the elite interviews laid out another consensus. The main belief was that China was not interested in fundamentally remodeling international standard-setting. There was "less proof about China trying to remodel the system, but more proof about China trying to play the game of standard-setting" (EI 5). Elite interviewee 7 made an interesting remark:

> *"If this [a remodelling] is to increase the role of state actors, then yes. If this is setting up a separate standardization system of standard setting bodies […], for now, […] it is not being pushed forward. If it is about fundamentally changing the rules of how to set technical standards, then no."*

In a nutshell, China is striving for achievement in the digital standard-setting domain. On the question of there being a strong Chinese desire to achieve success in international standard-setting, the answer was unambiguously "yes, absolutely" (EI 7). Indeed, the findings showed that China evinces assertive aspirations in the digital standard-setting domain and is furthering a strategic, government-directed approach to achieve said aspirations. In fact, "Beijing's digital strategy hinges on setting emerging technical standards globally" (de La Bruyère, 2022, p. 50)

and thus "treats technical standard-setting as an opportunity, and strategic imperative, of the digital revolution" (ibid). Although its digital standard-setting is not elite yet, in the qualitative sense, it has understood that to transform from "the workbench of the world to innovation powerhouse" (EI 7) and become a "technology leader abroad" (ibid.), digital standard-setting is a crucial aspect. As such, "the goal is ultimately to facilitate China's modernization and transform the country into a premier purveyor of standards globally" (Seaman, 2020, p. 10-11).

6.2 Strengthening American Leadership

Against the backdrop of an increasingly assertive Chinese, *inter alia*, in standard-setting, in May 2020, the US published the 'United States Strategic Approach to the People's Republic of China' detailing a comprehensive response toward the increasingly assertive strategic rival. To the observing eye, it was conceivable that a surprisingly strong focus was laid on standards. In fact, the document published under the Trump administration can be said to have acted as a "concrete policy direction against China's international standardization" (Lee, 2021, p. 43). Later that year, the 'Ensuring American Leadership over International Standards Act of 2020' was presented with the aim of investigating how China's standard-setting activities and their actions in SDOs affected international standard-setting for emerging technologies (Cortez Masto, 2020).

This politicization of digital standard-setting did not budge with Biden assuming office. On the contrary, he urged that "as new technologies reshape our [American] economy and society, we must ensure that these engines of progress are bound by laws and ethics, […] and avoid a race to the bottom, where the rules of the digital age are written by China and Russia" (Biden, 2020). This acted as an ample reminder of "this almost inward-looking techno protectionism" (EI 1), the US pursues where "they essentially use technology, and within this purview, standard-setting power, to retain their leadership as the technological power, globally speaking" (ibid.).

More recently, the US has been exploring other avenues of strengthening the just mentioned American leadership in technical standard-setting. In March 2022, the US House Committee on Science, Space, and Technology, specifically the Subcommittee on Research and Technology, held a hearing coined "Setting the Standards: Strengthening U.S. Leadership in Technical Standards" (USHOR, 2022) with the purpose of discussing "the nature and importance of the standards-setting process to U.S. competitiveness and national security"

(ibid., p. 1). This came after calls for a more aggressive role of the US government in coordinating standard-setting. As a matter of fact, Cisco Chief Technology Officer Alissa Cooper was quoted saying (Nyczepir, 2022):

> *"I think now is an important moment for the U.S. to assert its own strategy, in particular because it could be valuable as a contrast to what the European Union has proposed."*

The hearing addressed ongoing challenges, for the US, of international standard-setting activities. These included aspects such as "overcoming closed national standards systems" (USHOR, 2022, p. 5), "competing in international standards bodies" (ibid., p. 6), and "developing a federal strategy on standards" (ibid., p. 7). Interestingly, within the discussions of all these ongoing challenges, both China and Europe were named as competing actors in relation to the American standard-setting leadership. More specifically, China's ambitions in standard-setting, as well as European ambitions reflected in 'China Standards 2035' and the new European standardization strategy, respectively, were named as standard-setting activities with the aim of gaining "competitive advantage" (ibid., p. 6), which worried American policy makers.

This observation of the US taking on a more strategic direction was underpinned by the results of the web survey. As a matter of fact, when asked about international standard-setting agendas, a strong majority of 91% believed that not only China and the EU were advancing strategic standard-setting agendas, but also others (LS 3d). Thereby, 19 of 24 WSRs stated that the US was one of these other actors. Simultaneously, when asked about said standard-setting ambitions targeting emerging and digital technologies, a strong majority of 84% believed also other actors, and thus the US, would advance strategic efforts towards it (LS 3h).

However, the politicization of standard-setting, or its thematization on a governmental level, the findings suggested, was not usual in the US. On the contrary, unlike China and the EU, the US is not amenable (nor does its domestic standard-setting structure allow it) to the idea of producing a government-level standard-setting engagement policy for the digital domain, or standard-setting more broadly. The only existing federal standard-setting strategy of some sorts is updated in a quinquennial rhythm by the American National Standards Institute (ANSI). First published in 2000, the "United States Standards Strategy" (ANSI, 2020) is a "vision for the future" (ibid., p. 4) of the American standard-setting structure. The strategy emphasizes that

the US "is committed to a sector-based approach to voluntary standardization activities, both domestically and globally" (ibid., p. 2) and that the proposed framework is built upon the "traditional strengths" (ibid.) of the American approach – that of "consensus, openness, and transparency" (ibid.).

The continuous emphasis on an American approach to standard-setting, focusing on industry direction and participation, is what has led to strong American success in standard-setting, and digital standard-setting especially, cementing American technological leadership. Within the US, official policy was "to support voluntary, consensus-based standards driven by private sector organizations and not governmental or intergovernmental" (Cooper, 2022, p. 4) mandates since the 1990s. It meant that it positioned "the actors driving innovation in the market to funnel their advances into the standardization process" (ibid., p. 5) and thus created qualitatively innovative and competitive outcomes. As a matter of fact, it is widely recognized that the US is dominant in standard-setting, broadly speaking (Rühlig, 2020).

Moreover, public policy was described as "partly irrelevant" (EI 5) within the American standard-setting system. Oftentimes digital standard-setting was driven by industry associations, such as the IEEE or the IETF. Members and participants of such associations were largely coming from an "ideological standpoint" (ibid.), one EI revealed, since said participants were concerned with the future of the internet and driving its development ahead. These industry experts were not amenable to the idea of working with the government. As such, the government participated as an "equal and interested partner" (Olthoff, 2022, p. 3), and only when it suited its needs without taking on a central position.

In other words, the US structure was described as "decentralized" (EI 5) with the role of the state being "really quite small" (ibid.). Hence, the domestic standard-setting structure was defined as a "hands-off, market-driven" (Lee, 2021, p. 46) approach around which "market logics predominate" (Seaman, 2020, p. 11) furthering "bottom-up, […], and sector-focused" (Olthoff, 2022, p. 5) standard-setting by as much as 600 SDOs (Seaman, 2020). Internationally (i.e., in IEC and ISO), the organization formally charged to represent American interests was the previously mentioned ANSI, which however, did not have any "authority over national standardization bodies" (Rühlig, 2020, p. 11), so the findings revealed. As such, it was far from having the same place value as the SAC in China, or even European SDOs.

Nonetheless, it is necessary to recognize that in particular circumstances, where self-organization does not provide the desired outcome in a timely manner, the National Institute of Standards and Technology (NIST) can intervene to a certain extent. NIST, which is an agency of the US Department of Commerce, can assume the role of an "effective convener" (Olthoff, 2022, p. 4) in areas where time is of essence and the catalyzation of standard-setting is needed. In the past, this has mean that NIST "brought together experts to create a kind of framework, or reference architecture" (EI 4) for federal engagement in specific technologies or government priorities "very fast and super good quality" (ibid.). Usually, to such an extent that it "outperformed the rest of the world" (ibid.). Currently, such areas include AI, or cybersecurity. Hence, the US government can, if needed and circumstances allow it, assume a more active role in standard-setting through NIST.

Against the given backdrop, the results indicated that the US wants to strengthen its standard-setting leadership, while not budging from the 'hands-off, market-driven' approach that was responsible for success in the past. It has been established that the US' focus was on maintaining and strengthening its standard-setting leadership, which has led to top quality in terms of standard proposals. This past success has been strongly tied to the industry-driven standard-setting structure. Yet, the US started exploring governmentally strategic avenues to retain its leadership in standard-setting. At this point in time, however, the results did not show any signs of said governmental excursus materializing in any way. Rather, experts emphasized the US' standard-setting strength in the 'hands-off, market-driven' approach.

6.3 Protecting the European Digital Single Market

The increased Chinese standard-setting assertiveness in the digital domain, so the findings suggested, are challenging for the EU and its standard-setting stronghold. In fact, most WSRs believed that a Chinese remodeling of the standard-setting status quo posits a risk for the EU – 79.2% agreed, whereas 12.5% strongly agreed (LS 18d). This risk was said to have various aspects, *inter alia*, of economic or strategic nature, or security- and sovereignty-related (WSR 12). For example, if China were to achieve standards dominance, it "could have a significant impact on the EU's competitiveness" (ibid.), it would enable China to shape "the direction and development of global digital technologies" (ibid.), or it could produce dependencies limiting "the ability of EU member states to shape their own policies and agendas" (ibid.).

Especially risky were areas that represent a void in the international standard-setting arena (i.e., the digital domain) and thus constituted the rationale for the EU not being able to adhere to an order led by China. In fact, 87.5% of WSRs believed that the EU could not accept a digital standard-setting order being driven by China (LS 18c). More specifically 66.7% agreed, whereas 20.8% strongly agreed. The findings showed, however, that China moved fast to fill said void and it was "its speed that posed a challenge for a slower EU" (WSR 2). Within the EU it was "not so straightforward […] to come up with a unified one single position" (EI 1). Rather, Europe was defined as "sometimes too diligent" (EI 4) in that it always had to debate "internally before having a coherent position (WSR 21).

This dilatoriness was prescribed to the fact that "private industry actors coordinate under the auspices of national […] and European" (Seaman, 2020, p. 11) SDOs. Within Europe there are "non-governmental institutions charged with coordinating standards development" (ibid.), being the European Committee for Standardization (CEN), the European Committee for Electrotechnical Standardization (CENELEC), and the European Telecommunications Standards Institute (ETSI). The members of the former two (i.e., CEN and CENELEC) are made up by national standard-setting bodies, and national electrotechnical committees for standardization respectively.[7] ETSI is distinct in that it allows direct participation by "industry and society that make use of ICT" (ETSI, s.a.), and membership that is not geographically limited to Europe. As a matter of fact, ETSI services more than 900 members deriving from more than 60 countries along five continents (ibid.).

Against this backdrop, the EU standard-setting structure was considered a hierarchically formed, "harmonized" (Rühlig, 2020, p. 11) PPP, which was responsible for international European success in standard-setting. Within the EU standards are developed by private standard-setting bodies. These developed standards underlie a hierarchical structure, which means that if they contradict European standards, they are automatically invalidated. In comparison to China, the European approach then is "less organized" (WSR 6) showing "a lot of fragmentation also within it" (EI 1). Hence, its ability "to really drive standards in one direction or another is still quite limited" (EI 4). The exception to this are "harmonized

[7] The members of the national standard-setting bodies, as well as the national electrotechnical committees for standardization are not constituted solely by EU member states but include non-EU states such as the United Kingdom, the Republic of North Macedonia, Serbia, Türkyie, as well as Iceland, Norway, and Switzerland (CEN, s.a.; CENELEC, s.a.).

standards" (EI 4), which are advanced in the form of a PPP (Zachariadis, 2019). Within this understanding, the development of specific standards can be proposed by the EC in "a degree of top-down" (WSR 9) standard-setting. This PPP made European standard-setting efforts internationally successful and turned the EU into a standard-setting stronghold. In fact, standard-setting efforts that came out of CEN, CENELEC, or ETSI were considered "pretty successful and good quality" (EI 4), enabling the EU to punch "above their weight" (EI 7).

Against this backdrop, a slow and uncoordinated nature of the European standard-setting structure, and the fact that digital standards represent a risky void, WSR 21 formulated the main challenge for the EU in the context of digital standard-setting:

> *"Running behind, amplified by the huge dynamics of tech development. De facto ending up being an ex-post regulator rather than an ex-ante innovator and shaping power."*

At this point, the EU's internal market takes on significance within the discussion of standard-setting. Europe's policies, also in relation to standard-setting, so the findings revealed, were always guided by the well-being of its internal market (i.e., the Single Market), or in this specific case the Digital Single Market (DSM), and its consumers (Zachariadis, 2019). Thereby, the goal is to maintain competitiveness, security, and the sovereignty of its market. This has meant that the EU evinced "a strong focus on developing and promoting standards that support the growth of the European economy" (WSR 12) and pushed an approach depicted in "advancing and defending their [European] industrial and commercial interests, seeking a level of economic resilience, and advancing values" (WSR 23). Ultimately, with the rationale of standards being crucial to delivering the market in a "resilient, green and digital" (EC, 2022a) way.

Therefore, back in 2016, the EC published a communication presenting a "comprehensive strategic and political approach to standardization for priority ICT technologies that are critical to the completion of the Digital Single Market" (EC, 2016, p. 2). The identified focus areas were 5G, cloud computing, IoT, big data, and cybersecurity, which together constituted the "essential technology building blocks of the Digital Single Market" (ibid., p. 5). Within the communication, the EC recognized a "need to catch up" (EI 1), stating that differing standards significantly slowed down "innovation and put European businesses at a disadvantage *vis-à-vis* the rest of the world" (EC, 2016, p. 2). Ultimately, the purpose of the communication was

to showcase that standard-setting had "not received the necessary level of political support" (ibid., p. 3) and therefore going forward it had to ensure that ICT standards were set "responsive to policy needs, agile, open, more strongly linked to research and innovation, better joined-up" (ibid., p. 2), and thereby had a better impact for the European economy in its digital transformation.

The elaborated aspirations took a more concrete form in February 2022, when the EC published a new standard-setting strategy to "propose a set of actions to put standards back at the core of a resilient, green and digital EU single market and to strengthen the global role of the European standardization system" (EC, 2022a, p. 1). The strategy that was described as "more focused than traditional sectors" (EI 3) recognized that "Europe's competitiveness, technological sovereignty, ability to reduce dependencies and protection of EU values, including our [European] social and environmental ambitions" (EC, 2022a, p. 1) would depend on how successful European actors were in international standard-setting. It also stated that in "new and emerging technologies, the European standardization system often fails to deliver in a timely manner and hence loses the important 'first mover' advantage through standardization" (ibid.).

Against the backdrop of this last notion, the EC pinned down so-called "standardization urgencies" (EC, 2022a, p. 1), in which, according to itself, standards were needed in the coming years "to avoid strategic dependencies and to manifest the EU's global leadership in green and digital technologies" (ibid., p. 2). Strategic areas, or such 'standardization urgencies' included, *inter alia*, "standards for the certification of chips in terms of security, authenticity and reliability; and data standards enhancing data interoperability, data sharing and data re-use in support of the Common European Data Spaces" (ibid.). Simultaneously, it focused on five key sets of actions crucial to the actuation of successful standard-setting such as to "anticipate, prioritize and address standardization needs in strategic areas" (EC, 2022b) and "enhance European leadership in global standards" (ibid.)

However, the fact that "Europe's emerging approach to digital standards seems to include a greater role for the government and officials trying to set digital standards" (WSR 9) and thus would increase "public facilitation in Europe" (WSR 15), did not go down well with everyone. The European strategy was described as "uninformed and helpless" (WSR 16), "very weak" (EI 4), at risk of losing itself in some "nitty gritty details" (ibid.) and more of a "position

statement than anything else" (ibid.). Especially, the fact that the strategy underrated the importance of the industry in standard-setting and was merely a "reaction to Chinese stakeholders' strategic agency in the realm of digital standards" (WSR 19) caused for incomprehension among respondents. For example, EI 4 stated that:

> *"What they [the EC] completely lack in their strategy, is supporting the role of industry in standardization. Without industry you do not get the experts, you do not get the best standards. If you look at this EU standardization strategy, industry does not exist or hardly exists, and that is a problem, I believe."*

Especially, the "bashing" (EI 4) of ETSI by the EC sparked discontent among respondents of this study. ETSI is industry-driven, and many of its members are not headquartered in the EU. In recent geopolitical realities this fact became a cause of concern for the EU in terms of "what that represents and what that means" (EI 5) for European interests. Based on these considerations ETSI was recently not included in the directive that gives European SDOs (i.e., CEN, CENELEC, and ETSI) the purview to work on standards – e.g., for AI, or cybersecurity (Cory, 2022). This sparked a big controversy. In fact, one reaction was that it should not have been "part of a strategy and should not have been done at this level" (EI 4). This aspect was especially interesting in relation to the fact that ETSI commissioned a report back in 2019 calling for the EU to retake leadership in digital standard-setting (Bildt et al., 2019).

In any case, what became clear throughout this study was a general belief that, alike China, the EU viewed "technical standard-setting as a component of a broader strategic agenda" (WSR 23). This was underpinned by the results of the web survey. When asked about its standard-setting agenda, alike China, all respondents believed that the EU is advancing a strategic one (LS 3a). To be more specific, 70.8% agreed, whereas 29.2% strongly agreed. When asked about this strategy targeting emerging and digital technologies, alike China, a strong majority of 96% believed it to be the case, whereof 62.5% agreed and 33.3% strongly agreed (LS 3e). One WSR added that the "digital stand[ard]-setting agenda has gradually become the center of EU politics" (WSR 8), whereas another stated that the EU was "committed to use standardization as a strategic tool for strengthening competitiveness" (WSR 10).

These findings were in line with statements made by the EC and in the standardization strategy. Competition Commissioner Margrethe Vestager, for example, declared that "this [the strategy]

is strategic" (Espinoza & Pop, 2022) and continued by saying that "it's really, really important who sets the standards because they should enable a market to work, but not to make innovation difficult" (ibid.). A similar rhetoric was observable within the strategy in that "the global race for digital leadership, the ability to shape international standards for digital products, processes and services as global benchmarks is essential for the EU's competitiveness" (EC, 2022a, p. 1).

Unlike China and the US, however, the European strategy showcased a crucial distinction. The findings evinced that the European approach to digital standard-setting advanced a "normative agenda" (WSR 14) and emphasized "European characteristics" (WSR 8) different to American and Chinese ones. In fact, European digital standard-setting was said to focus on "privacy protection" (WSR 2), as well as "democratic values" (WSR 4), and being "ethics-centered" (WSR 18) and "customer rights-focused" (ibid.) in the process.

In a nutshell, the European approach to digital standard-setting evinced to be driven mainly by a desire to protect its DSM. At the same time, European digital-standard setting was depicted as a "work in progress" (WSR 14) in which more influence on a governmental level was sought to guide "the standardization process according to industrial and strategic priorities" (ibid.). Accordingly, Industry Commissioner Thierry Breton said that "we [the EU] need to make sure we're not just a standard-taker" (Cerulus, 2022) and continued by saying that "we [the EU] need to be a standard-setter" (ibid.). However, this politicization of standard-setting, according to Rühlig (2021a), ran "the risk of turning standardization from a cooperative into a confrontational subject" (p. 12).

6.4 Struggle for Power vs. Constructing Consensus

Against the backdrop of politicization running 'the risk of turning standardization from a cooperative into a confrontational subject', the findings showed following realities. Internationally, the digital standard-setting condition has become increasingly "geo-politicized" (WSR 15). In this view, one's gain in digital standard-setting was to be seen as another's loss, and as such "more zero-sum" (WSR 23). For example, the digital standard-setting condition was described by one of the WSRs as "potentially destabilizing global standard-setting" (WSR 3). Especially, governments, was believed by one of the EIs, "currently

see standardization as if there is extreme competition" (EI 4) – a competition "over technology and standards [that] has become fierce" (WSR 8).

The findings of the web survey did not necessarily imply that digital standard-setting was a zero-sum endeavour, but they clearly showed that thematized actors engaged in a digital standard-setting competition. As a matter of fact, as seen in figure 4, the results indicated that the current digital standard-setting condition was a competition. In fact, most WSRs believed that a standard-setting competition was occurring within the digital domain (LS 6a). Thereby, 37.5% agreed, and 54.2% strongly agreed. Simultaneously, all WSRs believed that not only China, and the EU engaged in a digital standard-setting competition, but also other countries such as, *inter alia*, Japan, Russia, and South Korea (LS 6b-d).

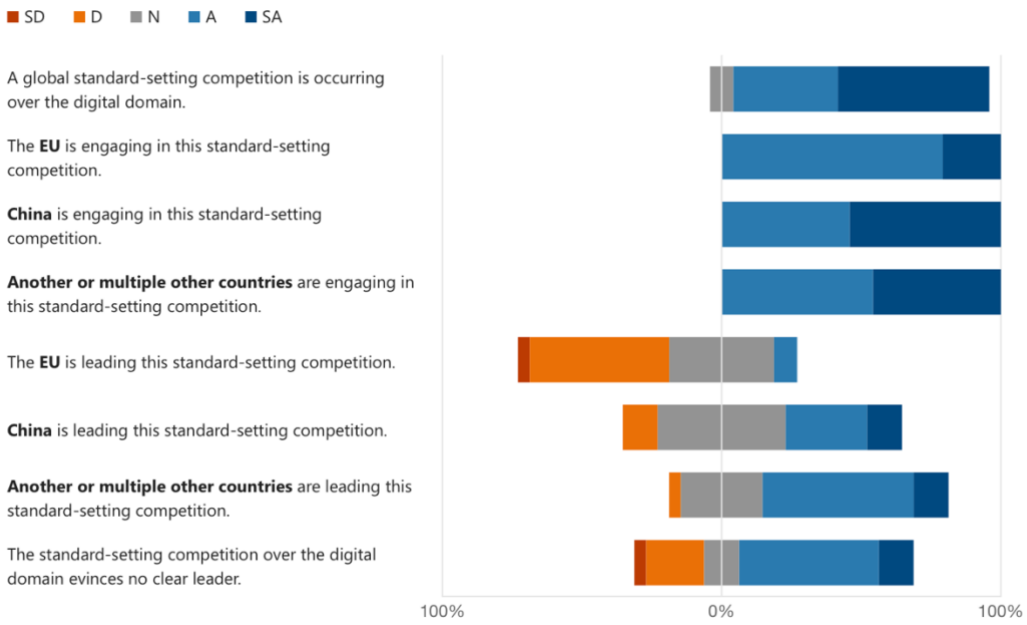

Figure 4: *Web Survey Insight on Digital Standard-Setting Competition*

Since this competition was described as "critical for future leadership in geopolitics" (WSR 1), the question arose as to who leads in digital standard-setting? What the remaining findings suggested was that there was no clear consensus. More than 50% of WSRs disagreed with the notion of the EU leading digital standard-setting, whereas 37.5% stayed neutral (LS 6e). In the context of China leading digital standard-setting, 45.8% stayed neutral, 29.2% agreed, and 12.5% strongly agreed (LS 6f). A lot of WSRs believed that, as figure 4 indicates, another or multiple other countries were leading the digital standard-setting competition (LS 6g). The

subsequent specification was mostly constituted by the US. Simultaneously, 62.5% believed that the digital standard-setting competition evinced no clear leader at given moment (LS 6h). As such, in respect of who is leading the digital standard-setting competition, the findings were inconclusive.

What became a bit clearer was that the EU had two distinct advantages over China in relation to the digital standard-setting competition. On the one hand, its governance type (i.e., rules-based) allowed for more sustainable decision-making compared to China, most WSRs believed (LS 10a). 45.8% agreed, 12.5% strongly agreed, and 16.7% remained neutral. When asked about China's power-based governance and if it would allow for faster decision-making in comparison to the EU, no clear consensus resulted (LS 10b). 33.3% agreed, 37.5% either disagreed or strongly disagreed, and 29.2% remained neutral. On the other hand, most WSRs believed that the EU had extraterritorial influence through the 'Brussels Effect' in that 62.5% either agreed or strongly agreed (LS 11a). Only 16.7% disagreed or strongly disagreed, and 20.8% remained neutral. Contrarily, only 33.4% believed that China would also have such an extraterritorial influence – 50% did not have an opinion on this, and 16.7% disagreed (LS 11b).

Moreover, the web survey indicated that the digital standard-setting competition had implications for digital standard-setting capabilities. When confronted with the statement of the digital standard-setting competition bearing implications for both Chinese and European capabilities almost all respondents believed that to be the case (LS 12a). To be more specific, 66.7% agreed, whereas 20.8% strongly agreed. When it came to the digital standard-setting competition having positive, or negative implications, the results were not so indicative (LS 12b-e). However, it can be said that the majority of WSRs believed that the digital standard-setting competition had positive implications, more than it had negative ones for both Europe and China. In the context of Europe, 50% believed that to be the case with 37.5% remaining neutral, whereas for China, 54.2% believed that to be the case with 29.2% remaining neutral.

Nonetheless, these findings were in line with the belief of there being a "perception gap between governments and industry" (EI 4). As stated in the first paragraph of this chapter, especially the respective governments were believed to have a very strategic view that sees digital standard-setting as a highly competitive endeavour with zero-sum outcomes. This belief was not shared in the industry. In fact, one of the elite interviewees said, "we do not see this in the same way, of course there is competition, but the competition is amongst companies, first

of all, and their products and solutions" (EI 4). The increasingly geo-politicized nature of digital standard-setting was described as counterintuitive in that "the more the standard setting system turns non-cooperative, the more it is essentially defaulting and failing, which is a risk" (EI 7). This was a tough line to draw according to EI 7:

> *"You neither want to fall victim to the Chinese agenda and just simply cooperate no matter what, considering its strategic implications, nor do you want to make it an arena where it is all about politics and you do not get anything done anymore, or do not properly consider cooperation anymore."*

Against this backdrop, the question as to what extent room for cooperation existed, arose. First it must be stated that most EIs believed digital standard-setting to be inherently cooperative. As a matter of fact, if a digital standard was "not accepted and adopted by the market, which includes of course market competitors" (EI 7) then that digital standard was "essentially useless" (ibid.). It was a bit more complex when digital standard-setting participants did not align in their views, which was when it became "really difficult to cooperate" (EI 1).

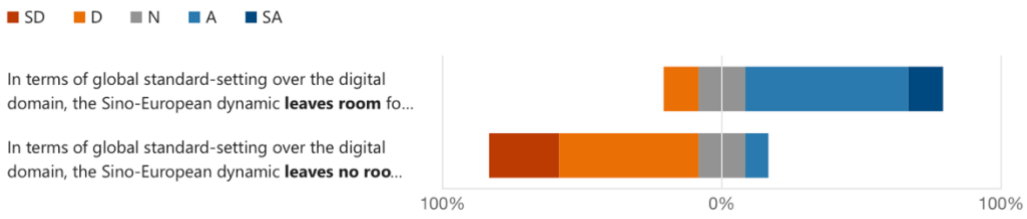

Figure 5: *Web Survey Insight on Digital Standard-Setting Cooperation*

However, the results of the web survey clearly indicated room for digital standard-setting cooperation in the sense of "a positive-sum scenario" (WSR 23). Specifically, in the context of the Sino-European dynamic, the majority of WSRs believed that there was room for cooperation (LS 17a). To be more specific, 58.3% agreed, whereas 12.5% strongly agreed. In concert, 75% did not believe that the Sino-European dynamic within digital standard-setting left no room for cooperation (LS 17b). Since this aspect did not thematize the US, it cannot be said if the same would still ring true if added to the equation.

Conclusively, based on the insights given, the digital standard-setting condition showcased both competitive and cooperative strands. The findings clearly showed that the digital standard-setting domain was increasingly turning into a struggle for power. However, at the same time, digital standard setting was inherently about constructing consensus. This aspect meant that the digital standard-setting condition was described as "something in between competition and cooperation" (EI 7). In fact, "it has always been something in between" (ibid.). As such, the results indicated a duality of "desire for open and transparent processes" (WSR 16), on the one hand, and "desire for control and influence" (ibid.), on the other.

6.5 Shifting Order?

Given duality unfolded in an arena, where digital standard-setting capabilities were believed to be imperative, by most WSRs, for the maintenance of the *status quo* (LS 15a). In the past, these capabilities were mainly ascribed to Western economies. The broad consensus was that international standard-setting was led by the EU, and the US. This assessment occurred repeatedly throughout the data gathering process. However, the findings indicated that within the digital standard-setting domain new realities were establishing themselves. This was surprising considering the strong standard-setting capabilities possessed by the Western powers.

To begin with, European standard-setting leadership did not transfer to the digital domain. As figure 6 indicates, 41.7% believed that despite its long-standing standard-setting capabilities, the EU would be running behind when it came to attaining the first-mover advantage for the digital domain, and thus allowed for a reshuffling of the global standard-setting order (LS 15c). Thereby, 29.2% remained neutral, and 29.2% disagreed or strongly disagreed. The general opinion was even clearer on the EU maintaining the current power dynamics (LS 15b). In fact, 45.9% did not believe that the EU, due to its long-standing standard-setting capabilities, would continue to lead standard-setting also within the digital domain, and thus maintain the *status quo*, whereby 25% remained neutral and 29.2% either agreed or strongly agreed.

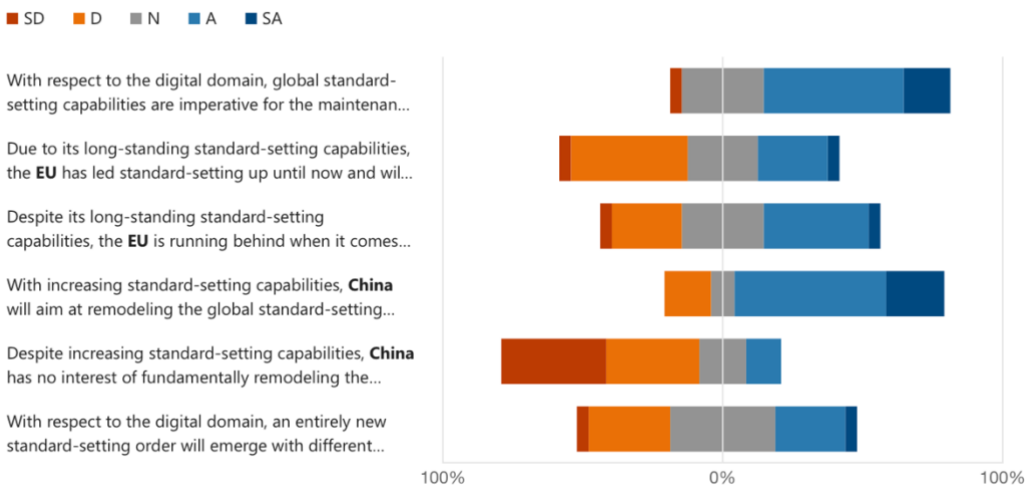

Figure 6: *Web Survey Insight on the Digital Standard-Setting Order*

This meant that China was demanding more space in the international standard-setting arena. Considering that standard-setting capabilities were not only believed to be imperative for the maintenance of the *status quo*, but also for the establishment of a new order, the occurrence of new realities in relation to the digital standard-setting order were not so surprising after all (LS 15a). China invested an enormous number of resources into "increasing its influence in international standard-setting" (EI 7), which has led to "a certain degree of success" (ibid.). In fact, China's digital standard-setting capabilities were on the rise: "their capabilities are very high" (EI2) and "absolutely up to international level" (ibid.) and would experience "moderate further growth" (EI 7) – "they have the experts, they have the knowledge" (EI 2). As such, China was "an actor to stay" (EI 7).

At the same time, however, rising Chinese digital standard-setting capabilities did not imply a deterioration of American and European capabilities. One EI believed "the Chinese just grew much faster" (EI 2). In fact, some believed that China's influence was anyway "generally overstated" (WSR 6) since it punched "below its weight" (ibid.). EI 7 had an interesting insight on this:

> *"China is a latecomer in standard-setting. If you look at studies that relate to these elements, you do see that it is quite difficult to catch up as a late comer in standard-setting. A lot has to do with reputation. There is still a lot of scepticism, which China is struggling with, but the longer it is in the field, the more established its organizations*

are. The more trust it has created within the technical community, […] the more likely it is going to be successful in those standard-setting processes."

To some extent, this meant that China was "blocked" (WSR 1) and was looking for a way of circumvention. As a matter of fact, "international standard-setting competition made China aware of its own deficiencies in technology, applications, and other aspects" (WSR 8). Hence, the web survey suggested that China was interested in remodelling the international standard-setting *status quo*. This was seen as the "real risk" (WSR 23), when "the development of technical standards would no longer be a multistakeholder, consensus-driven process, and wherein state actors would be able to wield much more power than they actually do" (ibid.), or one step further, if "parallel SDOs were created to challenge the current system" (ibid.). However, current attempts "to weaken certain multi-stakeholder SDOs (e.g., the IETF) through the strengthening of multilateral bodies (the ITU)" (WSR 14) encountered "resistance and roadblocks" (ibid.). WSR 14 added:

"The creation of a new order presupposes the weakening or collapse of the existing one. At present, the institutions underpinning the global standard-setting order are highly specialized, resilient, and largely reflective of the corporate balance of power in the digital economy."

As a matter of fact, the findings indicated that the distribution of power varied geographically and "between technologies" (WSR 15) depending on industrial strongholds. Since companies led standard-setting there was "not much governments could do" (EI 2). Although China was strong "in areas such as 5G" (WSR 8), telecom was "dominated more by ETSI and Alcatel and Nokia and Ericsson" (EI 2), and thus the EU, whereas the US was leading the rest of the digital domain. As such, China, the EU, and the US were believed to be "the three most important players" (WSR 8) in digital standard-setting because they had strong industries in varying fields of the digital domain. In a nutshell, the results suggested that "the strongest industry leads standardization" (EI 2). In that sense, "wherever the strongest industry" (ibid.) was, "the most impact on standardization" (ibid.) was made.

Against this backdrop, the consensus among WSRs and EIs was that an entirely new order could not be easily shaped since the digital standard-setting domain was "a complex and uncontrollable space […] not amenable to state control" (EI 6). China "of course gained

influence" (EI 7), which would "come to some cost to Europeans and Americans" (EI 7), but in general, the view was that "standardization, if successful" (WSR 16) needed to be "balanced" (ibid.). In that sense, digital standard-setting was "neither a zero-sum nor a positive-sum game" (EI 7), but a combination of "top-down, bottom-up processes, with different stakeholders playing different roles in the development and adoption of standards" (WSR 16), which needed "inherently to be a cooperative game" (EI 7).

7 Connecting the Dots

Digital standard-setting was essentially about "exercising political power and trying to influence as much of the digital domain as possible with own political norms and values" (WSR 21), at least so one of the WSRs believed. According to that understanding, digital standard-setting is a struggle for power. But is it really? The following discussion tries to get to the bottom of this by bringing together the conceptual framework and the results. For one, it is assessed if China, the EU, and the US can be considered great digital standard-setting powers. To do that, the conceptions of digital standard-setting ambition, and digital standard-setting capability are employed. Thereafter, the digital standard-setting condition is defined based on contextual variation of the ambitions of the constructed great digital standard-setting powers. Moreover, the digital standard-setting order is depicted based on numerical variation within the capabilities of the great digital standard-setting powers. To conclude, the digital standard-setting condition and order are united to explore the geopolitical power dynamics within the digital standard-setting domain.

7.1 Great Digital Standard-Setting Powers

In retrospect, the conceptual framework propounded that influence varies mainly according to the type of goals an actor pursues, captured by the conception of digital standard-setting ambition, and the ability to mobilize said ambitions through (in)tangibles, captured by the conception of digital standard-setting capabilities. Each concept will be employed in turn, starting with the former.

On the one hand, China advances revisionist digital standard-setting ambitions. The findings suggesting China is striving for success in digital standard-setting align with offensive neorealist views of power maximization. As established earlier, offensive neorealists hold that states constantly try to increase their power to become superior to other actors in the system. In concert with this notion, Chinese digital standard-setting efforts are driven by the desire of becoming a technological superpower, and digital standards supremacy has been pinned down as one of the avenues to get to that point. In fact, the Chinese approach was described by one expert as "pragmatic" (WSR 11). At the same time, Chinese ambitions point towards being revisionist in the sense of not being satisfied with the current power distribution. The findings suggested that China was aiming at remodeling the digital standard-setting *status quo* – not in

the sense of revisioning the way standards are set but increase the role of state actors (EI 7). In other words, it wants to have a bigger say in the digital standard-setting domain. Against this backdrop, it can be said that if an offensive ambition equals the revision of the power distribution within the digital standard-setting domain, China is its best current proponent – thereby, living up to the expectation stated in the conceptual framework.

On the other hand, the US pursues protectionist digital standard-setting ambitions. The findings suggesting the US is strengthening its leadership in standard-setting align with defensive neorealist views of security maximization. As established earlier, defensive neorealists hold that states are more secure when maintaining the *status quo*, which is why they try to preserve the existing balance of power. Broadly speaking, the US industry has been the dominating power in standard-setting, and digital standard-setting more specifically. Therefore, it has no reason to aim for a remodeling of the *status quo*. Rather, what the findings suggested was, that the US is emphasizing the need to reinforce its private- and industry-driven standard-setting approach. This makes sense because the current system has enabled the US to lead. In other words, maintaining the status quo equals continuing American leadership, which is why the American approach was referred to as "veiled pragmatism" (WSR 11). Against this backdrop, it can be said that if defensive ambitions equal the maintenance of the power distribution within the digital standard-setting domain, the US is it best current proponent – thereby, living up to the expectation stated in the conceptual framework.

Surprisingly, the EU does also pursue protectionist digital standard-setting ambitions, tough with a slight, but crucial flavor. The EU, alike the US, is amenable to maintaining the status quo, in terms of the balance of power within the digital standard-setting domain. As established, international standard-setting, up until now, occurred in a system in which the EU "punch above their weight" (EI 7). A revision of the status quo, in that regard, would mean that "the ones who suffer most are the Europeans" (ibid.). However, the EU's role in standard-setting is not so much about pursuing technological leadership like China, and the US. The findings suggested that the European protectionist ambitions are driven by the well-being of the European DSM. As such, they center around ensuring the competitiveness, security, and sovereignty of its DSM and while doing so maintaining a normative layer in the form of 'European characteristics'– i.e., European values. Therefore, it has been referred to as "idealism" (WSR 11). Against this backdrop, it can be said that the EU showcased distinct

protectionist digital standard-setting ambitions that can be pinned down as idealistic – thereby, not living up to the expectation stated in the conceptual framework.

Upon the demarcation of revisionist Chinese ambitions, protectionist American ambitions, and idealist European ambitions, the question as to who can mobilize said ambitions arises. The answer is certainly much more complex than the one provided, considering that tangibles (e.g., personnel participation, process participation, and *de facto* standardization) were dispensed with in the context of this thesis project. However, it seems unlikely that the inclusion of tangibles would have painted a completely different picture in terms of determining the ability of mobilization. In any case, what the following paragraphs provide, is a discussion on the state respective intangibles of digital standard-setting. In that regard, what can be said, is that China, the EU, and the US vary in terms of structural and reputational factors.

Starting with the former, the findings evinced various domestic standard-setting structures. China showcased a government-directed standard-setting structure, which had been the main driver of its standard-setting progress since entering the WTO. Hence, some said the Chinese standard-setting strategy had "more teeth to it" (EI 6). The EU was described as "somewhere in between" (EI 4) China and the US due to its 'harmonized' PPP. The governmental role in standard-setting, the findings suggested, was increasing in the context of the EU, but still far away of being par with China. The US evinced an entirely private- and industry-driven standard-setting structure, meaning that their standard-setting structure was described as 'decentralized' and fragmented. This inability of the EU, and the US of having a major role in digital standard-setting on a governmental level was especially prevalent regarding the "misbalance in providing people for standardization" (EI 4):

> *"I keep saying if we in the West want to send half of a person to standardization, we need to have a business case, we need to justify it internally. If China wants to send 20 people, they send 20 people. It's as easy as that. So, quantity is clearly their big asset."*

Alike the structural factor, in terms of reputation, the findings implied variation. For one, the results clearly showed that China's digital standard-setting efforts were strong in quantitative terms, but less so in qualitative. The standard-setting structure, which enabled China to act much quicker than its competitors, while in a concerted way was fundamental in China's standard-setting catch-up phase. However, the incentivization of quantity led to a lack of

quality and thus little reputation when it comes to digital standard-setting capabilities. Moreover, the EU was positioned well in terms reputation. Its technical expertise and qualitatively strong standard-setting activities meant that the EU established a high standing and allowed it to "punch above their weight" (EI 7), although not on par with the US. Reputationally, the strongest actor was unambiguously the US, since the findings suggested that the US industry was still dominant in digital standard-setting, and American standard-setting activities usually outperformed others.

Against this backdrop, it can be said that the intangible capabilities balance themselves out. On the one hand, the structural factor sees China better positioned than the EU, and the US. As established earlier, Mattli and Büthe's (2003) institutional complementarity approach holds that states with a 'hierarchical domestic institutional structure' (i.e., China, and the EU) have a more seamless *modus operandi*, allowing it to be more successful when it comes to the ability to exert influence in standard-setting. On the other hand, the US evinced to be superior in relation to the reputational factor. The reality of a dominating American digital industry, and the fact that American standard-setting activities are said to be of high quality generally lets it outrank both China and the EU. Conclusively, the EU's leeway is in between China and the US. In terms of structure, it resides just after China, and in terms of reputation just after the US.

Apart from slight variations, what is for certain, is the fact that all actors (i.e., China, the EU, and the US) do not only evince digital standard-setting ambitions (i.e., revisionist, protectionist, and idealist), but also the ability of mobilizing said ambitions through digital standard-setting capabilities (i.e., structural, and reputational intangibles). Hence, it can be concluded that China constitutes a revisionist, the EU an idealist, and the US a protectionist great digital standard-setting power.

7.2 The Duality of Digital Standard-Setting

Since standard-setting is largely pursued in consensus-based procedures, an argument can be made for the digital standard-setting condition being inherently cooperative. As established in the conceptual framework, cooperation is considered a 'mutual coordination of activities for common benefit'. In accord with given notion, consensus-based procedures that bring afore digital standards are a mutual coordination in the cooperative sense. For example, within SDOs,

where participation is open to everyone, standards are developed in a transparent, and impartial manner, despite 'discord' existing. Why is that? Because common interests exist. Interoperability, or compatibility are outcomes of standards, or digital standards, that let the globalized, interdependent world function, which implies that "the best way for the world is […] to work together to strive for development" (WSR 8). However, "even where common interests exist, cooperation often fails" (Keohane, 1984, p. 6).

Said complexity is what underlies the digital standard-setting condition. Cooperation has oftentimes become difficult, even "impossible to achieve due to factors such as national security, geopolitics and so on" (WSR 8). Although cooperation is certainly prevalent, with an increasingly geo-politicized digital domain, a fierce competition is occurring over digital standards supremacy. Especially, the data gathered by the web survey underpinned this fact. The construct of consensus is being sidelined by a struggle for power – mainly, due to the 'distributional consequences' digital standards omit, and the transformative force they possess. This is an amid reminder of China, the EU, and the US being inherent competitors despite intermittent cooperation. Yet, "characterizing it [the digital standard-setting condition] as competition is too simplistic" (WSR 2). Rather, the digital standard-setting condition should be considered as "competition, cooperation and sometimes compromise to get consensus" (EI 3).

Against this backdrop, the expectation that the digital standard-setting condition would showcase a state of competition, constituted by a struggle for power, did not come to fruition – at least not fully. Although the great digital standard-setting powers show contextual variation (i.e., protectionist, revisionist, and idealist) within their ambitions, and thus should result in a struggle for power, constructing consensus is still at the very core of international standard-setting. Hence, the reality evinces a combination of competition and cooperation, and as such, a duality of 'desire for open and transparent processes' and 'desire for control and influence' mirrored in the notions of constructing consensus, and struggle for power. This duality is better explicated with the notion of "coopetition" (Luo, 2004).

'Coopetition' is a concept largely used within economics and international business to depict "the interdependence in which competition and cooperation simultaneously occur between two or more rivals competing in global markets" (Luo, 2004, p. 12), but can be helpful in portraying the digital standard-setting condition as well. Since the thematized states "engage in complex

and simultaneous competitive-cooperative relationships with their global rivals" (ibid., p. 11), they can "gain an advantage by using a judicious mixture of cooperation" (Hayes, 2022) by forming "a strategic alliance designed to help both" (ibid.). These theoretical notions appropriately reflect the current digital standard-setting condition in that the 'judicious mixture of cooperation' is mirrored in the consensus procedures in digital standard-setting on an international level. In that sense, although digital standards have a strategic power layer states struggle for, consensus is sought to construct for the globalized, interdependent (digital) economy to function, thereby essentially ensuring economic gain for all actors involved.

However, the concept of 'coopetition' is not only useful in the context of digital standard-setting specifically, but also more broadly in the field of IR. For one, industry drives standard-setting. Coupling given fact with the idea of 'coopetition' traditionally being used in economics and international business, therefore makes of its employment, within the confines of this paper, an appropriate endeavor. Moreover, "coopetition is common in the technology industry" (Hayes, 2022). Since this thesis project thematized the digital domain, gives the rationale for its administration another matching layer. To conclude, said conceptual notion can be helpful more broadly in the field of IR, not only because the field is also concerned with the global political economy, but also since it provides a refreshing view in that it does not employ the otherwise so common binary, or dichotomizing approach to the study of IR.

7.3 Coopetition in a Multipolar World

Based on the numerical variation in the digital standard-setting capabilities of the various great digital standard-setting powers, multiple actors have the ability to wield influence. For instance, American protectionist, and European idealist ambitions associated with the maintenance of the *status quo*, as well as the Chinese revisionist ambitions associated with the establishment of a new order, in terms of power distribution, can be backed by credible digital standard-setting capabilities. Accordingly, at least three great digital standard-setting powers (i.e., China, the EU, and the US) exist in the digital standard-setting domain. As such, in relation to the conceptual framework, the power distribution within the digital standard-setting domain can be said to reflect a multipolar world. EI 7 concurs:

"It needs to be a multipolar world, and it has always been, I think. Even if you factor China out, it has been massively shaped by the EU, the US and Japan. That are three poles already."

In the sense of the polarity theory, this multipolar digital standard-setting order signifies a limited power disparity. According to the findings this can be ascribed to the consensus-based nature of the system, but also to the fact that the various states have differing leading industries. As such, power is distributed "more like in waves" (EI 3). For instance, as stated earlier, China leads in broadcasting, the EU in telecom, and the US in predominantly the rest. This dynamic is the result of a crucial characteristic of international standard-setting, so EI 6 believed:

"It is very simple. Standard-setting is a rich man's game, a country is strong in standard-setting because it is a wealthy economy, not the other way around, usually at least. The ability to set standards generates sources of economic prosperity that are very difficult to reproduce."

Against this backdrop, what can be said is that the great digital standard-setting powers engage in a coopetition, which occurs in a multipolar world. The digital standard-setting domain, that is little amenable to state control, evinces a combination of both competitive and cooperative practices because internationally, ultimately, it is driven by the (digital) industry. Although the field has recently seen an upsurge of geopolitical tendencies as states have upped their desire to set digital standards, and willingness to treat the digital standard-setting domain as a struggle for power, the interest of constructing consensus remains at the very core. Conclusively, the previously stated duality of 'desire for open and transparent processes' and 'desire for control and influence' mirrored in coopetition will always exist in a multipolar world, as long as digital standards have the strategic importance they do (i.e., economically, politically, and societally) the state-specific ambitions (i.e., interests, norm- and value-frameworks) diverge, and capabilities are distributed amongst varying actors. In other words, the digital standard-setting domain is a good representation of the existing complexity in international relations, and the difficulty of breaking down issues in binary ways.

8 Conclusion

Based on the increasingly geo-politicized nature of international standard-setting, this thesis project set out to explore if said development introduced a new understanding (i.e., of China, the EU, and the US) in relation to the research subject at hand. Is international standard-setting adhering to the consensus construct or transforming into a struggle for power? Up until now, international standard-setting has largely been a strictly technical realm, driven by heavy industry participation and operating in accordance with consensus-based procedures. Lately, the increasing geo-politicization of international standard-setting ran the risk of turning the arena into a political realm, and hence realizing a new avenue for power struggles. However, since the very purpose of (digital) standards is to further tenets such as compatibility, efficiency, interoperability, or transparency, this development is obviously counterintuitive.

Therefore, by focusing on the digital domain, as a demarcation within the broader context of international standard-setting, the main objective of this thesis project was to deconstruct given phenomenon through an exploration of the current geopolitical power dynamics of the digital standard-setting domain from an IR perspective. To do this ambitious endeavor justice, an exploratory, qualitative approach was launched, employing four concepts (i.e., digital standard-setting ambition, digital standard-setting capability, digital standard-setting condition, and digital standard-setting order), identified as appropriate parameters to provide an updated account on the power dynamics within the digital standard-setting domain, to classify the findings. So, what did these power dynamics reveal?

China, the EU, and the US all constitute great digital standard-setting powers that can be characterized as revisionist, idealist, and protectionist respectively. On the one hand, all thematized actors showcased digital standard-setting ambitions. Although they overlapped in their strategic character, they varied contextually. For instance, China follows revisionist ambitions in that it wants to reshuffle the current power distribution within the digital standard-setting domain, the US follows protectionist ambitions in that it wants to maintain said power distribution, and the EU follows idealist ambitions in that it wants to protect its norms and values. On the other hand, all thematized actors showcased digital standard-setting capabilities. China, the EU, and the US evince varying but outbalancing intangibles. For instance, China's hierarchical domestic standard-setting structure makes for a strong structural factor, the US'

sophisticated digital industry makes for a strong reputational factor, whereas the EU hovers around in between. All in all, this means that all actors possess the ability to wield influence in the digital standard-setting domain, and hence constitute great digital standard-setting powers.

The condition these great digital standard-setting powers produce is a duality mirrored in the concept of coopetition. Referring to the statement at the beginning of this chapter – i.e., adherence to the consensus construct *versus* transformation into a struggle for power –, the findings suggested the digital standard-setting condition to evince a duality. Although contextual variation existed within the great digital standard-setting powers' ambitions (i.e., idealist, protectionist, and revisionist), the reality did not solely reflect a competitive environment. On the contrary, international standard-setting has an inherently cooperative layer reflected in the need to construct consensus for a (digital) standard to succeed. Hence a duality exists within the digital standard-setting domain, which is referred to as coopetition – the simultaneous occurrence of competition and cooperation among rivals.

At the same time does the existence of multiple great digital standard-setting powers – i.e., actors able to wield influence in the digital standard-setting domain – constitute the basis for a broad power distribution. The fact that the findings isolated at least three great digital standard-setting powers, signifies an occurrence of multiple poles (i.e., 3 or more), and hence a multipolar reality. Said reality evinces a limited power disparity, which can be ascribed to the consensus-based nature of the digital standard-setting domain, but also distributed technological sophistication. Since the industry drives international standard-setting, digital standard-setting power is distributed along industrial strongholds. For instance, China and the EU have strong industries in broadcasting technology, and telecom technology respectively, and hence wield most standard-setting influence in these realms.

Against the backdrop of these considerations, the only remaining aspect in need of address, is the research question: *How are the geopolitical power dynamics within the digital standard-setting domain to be understood from an IR perspective?* The concise answer is: From an IR perspective, the geopolitical power dynamics within the digital standard-setting domain are to be understood as coopetition in a multipolar world. This is the result of great digital-standard-setting powers showcasing a dual understanding of digital standard-setting, i.e., of a 'desire for open and transparent processes' and a 'desire for control and influence'. Given *dictum* opens new avenues for further investigation. For instance, what would be interesting to address is the

question as to what extent international standard-setting, as it operates currently, facilitates a multipolar order, or if said order is a stable construct in the face of geopolitical ascendance.

Moreover, I would be remiss in not stating that this thesis paper, since it was written in the context of an IR master program, is very much focused on state actions, and relationships. Although the paper tried to reiterate the significance of the private industry and its companies in international standard-setting, said actors found little resonance throughout the paper. On the good side, this means that there are more avenues to explore. For instance, against the idealist backdrop of the European ambitions, it would be insightful to investigate if and how the EU mobilizes European technology companies to include ethical and normative aspects in their standard-setting endeavors (e.g., responsible, and trustworthy AI). On another note, the recent ETSI controversy might deserve further focus by exploring how credible European concerns about ETSI neglecting European interests are, or how the exclusion of ETSI in recent European standard-setting directives affects its standard-setting landscape.

In any case, this paper is not only contributing to the expansion of the understanding around the geopolitics of standard-setting, but also acts as an avid reminder of the international realm being a highly complex construct. Although an IR lens is a helpful tool to make sense of a complex world, it often falls victim to oversimplification. Through the insight of the studied phenomenon – i.e., showcasing a complexity in that coopetition is occurring in a multipolar world – such oversimplification is steered against. As such, the crucial contribution of this paper is placing itself in the 'messy' middle, instead of showcasing a clearly cut, black and white situation. In other words, this thesis argues, by means of the studied phenomenon, the international realm of evincing more layers, and being decisively more complex than the dichotomizing reality IR oftentimes portrays to observe.

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Appendices

Appendix A: Analyzed Documents Overview[8]

Official Documents

- An EU Strategy on Standardization: Setting global standards in support of a resilient, green and digital EU single market, *Published by the European Commission in 2022*
- ICT Standardization Priorities for the Digital Single Market, *Published by the European Commission in 2016*
- Hearing Charter on Strengthening U.S. Leadership in Technical Standards, *Published by the Subcommittee on Research and Technology of the House of Science Space & Technology Committee in 2022*
- Main Points of National Standardization Work in 2020, *Translated by Seconded European Standardization Expert for China in 2020*
- National Standardization Development Outline, *Translated by Center for Security and Emerging Technology in 2021*
- Testimony of Alissa Cooper on Strengthening U.S. Leadership in Technical Standards, *Published by the Subcommittee on Research and Technology of the House of Science Space & Technology Committee in 2022*
- Testimony of James Olthoff on Strengthening U.S. Leadership in Technical Standards, *Published by the Subcommittee on Research and Technology of the House of Science Space & Technology Committee in 2022*
- The 13th Five-Year Plan for Economic and Social Development of the People's Republic of China (2016-2020), *Translated by Compilation and Translation Bureau, Central Committee of the Communist Party of China, Beijing in 2016*
- The 14th Five-Year Plan for National Economic and Social Development and Long-Range Objectives for 2035, *Translated by Center for Security and Emerging Technology in 2021*
- The National Medium- and Long-Term Program for Science and Technology Development (2006-2020), *Published by the State Council, The People's Republic of China in 2006*

[8] The entire respective references can be found in foregoing chapter, the bibliography.

- United States Standards Strategy, *Published by the American National Standards Institute in 2020*
- United States Strategic Approach to the People's Republic of China*, Published by the White House in 2020*

Private Source Documents

- Creemers, R. & Voo, J. (2021). China's Role in Digital Standards for Emerging Technologies – Impacts on the Netherlands and Europe, *Published by Leiden Asia Center (independent)*
- Cory, N. (2022). How the EU Is Using Technology Standards as a Protectionist Tool In Its Quest for Cybersovereignty, *Published by Information Technology & Innovation Foundation (independent)*
- de la Bruyère, E. & Picarsic N. (2020). China Standards 2035: Beijing's Platform Geopolitics and "Standardization Work in 2020, *Published by Horizon Advisory (independent)*
- de la Bruyère, E. (2022). Setting the Standards: Locking in China's Technological Influence, *Published by National Bureau of Asian Research (independent)*
- Rühlig, T. N. (2020). Technical standardization, China and the future international order: A European perspective, *Published and Commissioned by Heinrich-Böll-Stiftung (affiliated with the German Green Party)*
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- Seaman, J. (2020). China and the New Geopolitics of Technical Standardization, *Published by the French Institute of International Relations (independent)*
- Wang, P. & Liang Z. (2016). Beyond Government Control of China's Standardization System – History, Current Status and Reform Suggestions, *Published by East-West Center (independent)*
- Wei, K. H. (2022). China's National Standardization Development Outline: Policy Implications and Future Directions, *Published by Institute for Future Initiatives, Security Studies Unit (affiliated with the University of Tokyo)*
- Zachiaradis, I. (2019). Standards and the digitalisation of EU industry: Economic implications and policy developments, *Published by European Parliamentary Research Service (the European Parliament's in-house research service and think thank)*

Appendix B: Survey Questionnaire

Number		Type	Formulation
1		Likert-Scale	Digital standards carry a transformative force for the digital economy.
2		Standard Question	Can you provide examples that underpin your choice?
3	a	Likert-Scale	Both the EU and China advance strategic standard-setting agendas.
	b	Likert-Scale	Only the EU advances a strategic standard-setting agenda.
	c	Likert-Scale	Only China advances a strategic standard-setting agenda.
	d	Likert-Scale	Another or multiple other countries advance strategic standard-setting agendas as well.
	e	Likert-Scale	Both European and Chinese standard-setting ambitions target emerging and digital technologies.
	f	Likert-Scale	Only European standard-setting ambitions target emerging and digital technologies.
	g	Likert-Scale	Only Chinese standard-setting ambitions target emerging and digital technologies.
	h	Likert-Scale	Another or multiple other countries' standard-setting ambitions do also target emerging and digital technologies.
4		Standard Question	Could you name which other countries advance strategic standard-setting agendas for the digital domain (if you agreed with the according statement above)?
5		Standard Question	How would you respectively characterize the European and the Chinese standard-setting agendas for the digital domain?
6	a	Likert-Scale	A global standard-setting competition is occurring over the digital domain.
	b	Likert-Scale	The EU is engaging in this standard-setting competition.
	c	Likert-Scale	China is engaging in this standard-setting competition.
	d	Likert-Scale	Another or multiple other countries are engaging in this standard-setting competition.
	e	Likert-Scale	The EU is leading this standard-setting competition.
	f	Likert-Scale	China is leading this standard-setting competition.
	g	Likert-Scale	Another or multiple other countries are leading this standard-setting competition.
	h	Likert-Scale	The standard-setting competition over the digital domain evinces no clear leader.
7		Standard Question	Could you name which other countries engage in the global standard-setting competition over the digital domain (if you agreed with the according statement above)?
8		Standard Question	Could you name which other countries lead the global standard-setting competition over the digital domain (if you agreed with the according statement above)?
9		Standard Question	How would you characterize the global standard-setting competition over the digital domain?
10	a	Likert-Scale	The EU's rules-based governance allows for more sustainable decision-making (in comparison to China) and thus gives it an edge in the standard-setting competition over the digital domain.
	b	Likert-Scale	China's power-based governance allows for faster decision-making (in comparison to the EU) and thus gives it an edge in the standard-setting competition over the digital domain.
11	a	Likert-Scale	The EU's influence over other countries through the Brussels Effect gives it an edge in the standard-setting competition over the digital domain.
	b	Likert-Scale	China's influence on other countries through the Beijing Effect gives it an edge in the standard-setting competition over the digital domain.
12	a	Likert-Scale	The mentioned standard-setting competition bears implications for both Chinese and European standard-setting capabilities in the digital domain.

	b	Likert-Scale	The mentioned standard-setting competition will have positive implications for European standard-setting capabilities in the digital domain.
	c	Likert-Scale	The mentioned standard-setting competition will have negative implications for European standard-setting capabilities in the digital domain.
	d	Likert-Scale	The mentioned standard-setting competition will have positive implications for Chinese standard-setting capabilities in the digital domain.
	e	Likert-Scale	The mentioned standard-setting competition will have negative implications for Chinese standard-setting capabilities in the digital domain.
13		Standard Question	Could you provide examples of such implications (positive or negative)?
14	a	Likert-Scale	Europe's uncoordinated approach to standard-setting (seen in its inability to move as a bloc) weakens its standard-setting capabilities.
	b	Likert-Scale	China's coordinated approach to standard-setting (seen in its ability to move as a bloc) strengthens its standard-setting capabilities.
15	a	Likert-Scale	With respect to the digital domain, global standard-setting capabilities are imperative for the maintenance of the standard-setting status quo and the establishment of a new global standard-setting order.
	b	Likert-Scale	Due to its long-standing standard-setting capabilities, the EU has led standard-setting up until now and will continue to do so and thus maintain the standard-setting status quo– also when it comes to the digital domain.
	c	Likert-Scale	Despite its long-standing standard-setting capabilities, the EU is running behind when it comes to attaining first-mover advantage for the standard-setting of the digital domain and thus allow a reshuffling of the global standard-setting order.
	d	Likert-Scale	With increasing standard-setting capabilities, China will aim at remodeling the global standard-setting order for the digital domain.
	e	Likert-Scale	Despite increasing standard-setting capabilities, China has no interest of fundamentally remodeling the global standard-setting order for the digital domain.
	d	Likert-Scale	With respect to the digital domain, an entirely new standard-setting order will emerge with different spheres of influence.
16		Standard Question	Could you explain how such a new order could take shape?
17	a	Likert-Scale	In terms of global standard-setting over the digital domain, the Sino-European dynamic leaves room for cooperation.
	b	Likert-Scale	In terms of global standard-setting over the digital domain, the Sino-European dynamic leaves no room for cooperation.
18	a	Likert-Scale	China's greatest potential in terms of standard-setting capabilitites lies in the digital domain due to the fact that the realm is little standardized and new technologies emerge constantly.
	b	Likert-Scale	With respect to the digital domain, China fills a void in the global standard-setting ecosystem, which enables it to remodel the global standard-setting order.
	c	Likert-Scale	The EU could not accept a global standard-setting order of the digital domain being driven by China.
	d	Likert-Scale	Such a remodeling of the standard-setting status quo posits a risk for the EU.
19		Standard Question	Could you explain what kind of void China fills, or give examples?
20		Standard Question	Could you give examples of potential risks for the EU?

Appendix C: Elite Interview Guide

Digital Standard-Setting Ambition

1. How would you summarize the international standard-setting ambitions of China, the EU, and the US in the digital domain? Are they strategic or not?
2. Is there a strong desire or determination to achieve success?

Digital Standard-Setting Capabilities

3. "China's influence over standards is both growing and greater than most analysts recognize." What is your take on said Likert-Scale?
4. How and where did it have the most impact?
5. What are the impacts of this increasing influence on the digital standard-setting capabilities of the EU and the US?
6. Is anybody influencing standard-setting through extraterritorial influence? If so, how?
7. My survey suggests that the EU's uncoordinated approach to standard-setting, opposed to China's coordinated approach, weakens its standard-setting capabilities. What is your take on that?

Digital Standard-Setting Condition

8. Which condition do you think the international standard-setting condition resembles most: a competition, cooperation, or something in between?

Digital Standard-Setting Order

9. Is the current digital standard-setting order unipolar, bipolar, or multipolar?
10. Is the digital standard-setting order shifting? If so, into what direction?
11. My survey suggests that China has an interest in fundamentally remodeling the digital standard-setting order. What is your take on that?
12. Do you think the shifting standard-setting landscape is related to waning European and American standard-setting capabilities, or does it not necessarily imply that?
13. My survey suggests that the Sino-European dynamic in digital standard-setting leaves room for cooperation. What is your take on that?
14. The Sino-American rivalry has introduced strains of decoupling, and bifurcation globally. Are such decoupling trends also entering the digital standard-setting domain? If so, what are its implications for the international standard-setting system?

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