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Thorsten Jelinek



The Digital Sovereignty Trap

Avoiding the Return
of Silos and a Divided
World

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ISSN 2731-3352 ISSN 2731-3360 (electronic)
SpringerBriefs in International Relations
ISBN 978-981-19-8413-6 ISBN 978-981-19-8414-3 (eBook)
<https://doi.org/10.1007/978-981-19-8414-3>

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When I went to China, I went to teach; but every day that I stayed I thought less of what I had to teach them and more of what I had to learn from them.

Bertrand Russell's notes in 1920.

Foreword

I am delighted to write a Foreword for Dr. Jelinek's book, which investigates the role of information technology in the transformation of the global political economy. Dr. Jelinek points out the tremendous potential of this revolution to improve well-being for the whole global population. Dividing the world into segregated 'silos' would do great harm to the interests of the majority of the world's population. Telecommunications is a focal point of the revolution. The roll-out of 5G across the world will have a tremendous impact on economy, society and government. The 5G revolution involves an extended ecosystem that has been labeled the 'Internet of Things'.

Since the 1980s a revolution has taken place in information and communication technology (ICT). The revolution has penetrated every sector of the economy and society. It has transformed the way in which governments function. It has transformed financial services. It has transformed every part of non-financial services, including telecommunications, retail, travel and tourism, entertainment, mass media, professional services, health care and education. It has transformed every part of the world's manufacturing system, including aerospace, automobiles, beverages and biomedical products. The revolution has transformed the internal operations of global companies, enabling them to overcome managerial diseconomies of scale. It has also transformed the nature of the R&D process, the nature of their products, as well as the relationship of the systems integrator firms with their supply chain and with their customers. The pace of the ICT revolution is accelerating with the advent of cloud computing, artificial intelligence, machine learning and the Internet of Things.

The ICT sector has been the leading edge of innovation in the recent era, and it will be even more important in the years ahead. It is the sector in which by far the greatest amount is spent on R&D, amounting to over two-fifths of total R&D spending by the world's top 2500 companies.¹ The ICT industry has been characterized by a high level of mergers and acquisitions, which has contributed to a high level of industrial

¹ The G2500 companies are the world's 2500 largest companies in terms of R&D spending (EU, 2019, *The 2019 EU Industrial R&D Investment Scoreboard*, Brussels: EU). They account for around 90% of total corporate spending on R&D.

concentration in the industry. It is heavily research-intensive industry. In 2018/9 R&D spending in the ICT hardware and equipment sector amounted to 8.4% of net sales revenue, and in the computer software and services sector it amounted to 10.8% of sales revenue.

The ICT sector has evolved at tremendous speed. The innovations achieved by scientists and engineers in the firms within this broad sector have transformed the modern world, driven by high levels of R&D spending and ferocious oligopolistic competition from top to bottom of the ICT value chain. Since the introduction of the semi-conductor and the PC a wide array of new sectors emerged within the ICT industry, but within each sector oligopoly has developed at high speed.

Computer Software and Services

In the G2500 list there are 321 firms in the computer software and services sector, within which the top 20 firms account for 67% of R&D spending and 70% of sales revenue. Microsoft has maintained its early dominant position in PC operating systems. In the Enterprise Resource Planning (ERP) sector, the top five firms account for around one-half of the global market. Outside China, Google established a dominant position in search engines and Facebook established a dominant position in social media, which they have maintained since then. Google and Facebook account for over one-half of global digital advertising revenue. Google (Android) has around three-quarters of the global market for smartphone operating systems.

Cloud computing has grown rapidly in the past recent years. It is the foundation of the Internet of Things. Three super-large firms—Amazon, Microsoft and Alphabet-Google—have leveraged their dominant position in other parts of the digital world to establish an early lead in cloud computing software and services. The three behemoths account for 38% of the total R&D spending and 34% of the net sales revenue for the 321 firms in the G2500 ICT software and services sector. Collectively, they account for almost 60% of global revenue from software services for the public cloud. The customers for the giant cloud companies' services are drawn from a wide array of sectors, including financial services, automobiles, energy systems, pharmaceuticals, health care, media and entertainment, retail, hospitality, manufacturing and government. The three behemoths perform on-demand data storage, data analysis and machine learning for a wide array of sectors. They offer their customers on-demand cloud services, which means that they can avoid investing in their own 'private cloud', which may operate at less than full capacity. Their customers benefit from state-of-the-art network infrastructure purchased by the giant cloud computing companies. The vast size of their network means that they can acquire equipment, which includes servers, routers and switches, more cheaply than small-scale private cloud systems. They play a vital role within the 'Internet of Things' that connects embedded semi-conductors across a wide array of machines. They also invest heavily in data security, including the security advantage of their closed-loop global dark fiber networks. They require a network of routers and switches to link the centers together

and need huge amounts of electricity to keep the server farms cool. It is estimated that 50% of the electricity used by data centers is devoted to keeping them cool.

Technology Hardware

There are 477 firms in the G2500 dataset from the technology hardware sector, within which the top 20 firms account for 51% of R&D spending and 66% of sales revenue. Two firms (Samsung and Apple) account for three-fifths of the global market for smartphones (by revenue). Servers are the workhorses of the whole ICT system, including the private and public cloud. Half a dozen firms, led by HPE and Dell, dominate the global server market. In advanced TVs a single firm, Samsung accounts for over one-half of the global market (by sales revenue). In telecoms equipment, the top five firms account for two-thirds. The value chain of these industries is also highly consolidated. One firm (Cisco) accounts for around one-half of the global market for telecoms routers and switches. The semi-conductor sector also is highly concentrated. Five firms account for about one-half of the whole market, but levels of industrial concentration are even higher in most sub-sectors of the chip industry. Intel accounts for around three-quarters of the global market for PC microprocessors. Two firms (Qualcomm and Apple) account for three-fifths of smartphone processors. One firm (Samsung) accounts for almost one-half of the global market for DRAM chips and a third of the market for NAND chips. Five firms account for around three-fifths of the global market for Wi-Fi chips. Five firms account for one-half of auto semi-conductors. Moreover, four firms account for two-thirds of the global market for semi-conductor equipment, which is a vital part of the innovation process in the semi-conductor industry.

The technology hardware sector embraces a wide range of sub-sectors in terms of their R&D intensity. PCs, printers and servers typically involve relatively low R&D intensity. Leading technology hardware companies from the first generation of the ICT revolution, such as IBM and HP, have divested their PC and low-end server divisions in order to focus on other parts of the ICT industry, which have higher margins and profitability. Smartphones and tablets involve medium intensity of R&D spending. However, they require high innovation skills in terms of product design and customer understanding. They require also sophisticated systems integration capability. The manufacture of their products involves complex value chains across the world, involving a wide array of sub-systems and components, including software, semi-conductors, screens, batteries and camera lenses. In addition, they involve large expenditure on marketing and branding. Telecoms equipment typically involves a high R&D intensity. Telecoms equipment is typically customer-specific. Innovation needs to closely integrate design, manufacturing and customer understanding. The telecoms equipment company's brand and reputation are affected critically by the level and quality of support provided to customers once they start using their equipment.

Within the ICT hardware industry, the semi-conductor sector stands out for the very high degree of research intensity. Among the top thirty ICT hardware firms, one-half are specialist semi-conductor manufacturers. However, as well as making complex electronic and telecoms equipment, Samsung, Apple and Huawei also are significant semi-conductor producers. In 2018 Samsung's revenues from semi-conductors were over US\$60 billion, making it the world's second-largest chip-maker. A significant share of its huge R&D spending of EUR 15 billion (2018) on R&D is devoted to advancing its technological capabilities in DRAM and NAND chips. In 2018 Samsung's semi-conductor division accounted for over three-quarters of its total profits. If the semi-conductor equipment sector is included, then 22 out of the top thirty ICT hardware companies ranked by R&D spending are in the semi-conductor sector, either as pure-play chip-makers or companies with large semi-conductor sub-divisions. Semi-conductors are a crucial part of the whole ICT industry. The sector sits at the center of the transformation of the modern world since the 1980s, and it will become even more important in the transition to the Internet of Things, machine learning and artificial intelligence. The foundation of this 'connected world' will be 'hundreds of billions' of sensors and smart devices. There will be a huge increase in the amount of data that will be generated, transmitted, stored, processed and analyzed.

Challenges and Opportunities

Each segment of the vast architecture of the IoT has become highly consolidated, with a few companies, almost all from the high-income countries, dominating each part of the structure. The IoT is a comprehensive ICT architecture. It includes a huge network of base stations. It also includes a global network of 'dark fiber', a widely distributed global network of data centers full of servers, a cloud computing software system, a global array of billions of smartphones, semi-conductors and software within the smartphones and hundreds of billions of semi-conductors embedded within 'connected devices'. Global security in the IoT needs to be considered not in relation to a single part of the architecture, such as telecoms equipment, but rather, in relation to the whole structure of global data transmission, storage and analysis and the surrounding value chain. As the world sets out on the journey of 5G, firms from the high-income countries dominate the whole ICT structure. This is a formidable competitive challenge for firms from developing countries.

Dividing the world into disconnected silos will harm the interest of the firms from high-income countries that dominate the global value chain in information technology. Moreover, it would hinder economic and social progress for people living in developing countries, who would benefit greatly from integration into the global 'Internet of Things'. It would prevent realization of the tremendous opportunities for 'win-win' that exist in the realm of information technology. Dr. Jelinek's study is published at a critical time in the structure of the global system of political economy. It makes a powerful case for the benefits that can accrue to the whole human species

consequent upon a globally connected world. Policies that damage the process of technological integration will turn 'win-win' into 'lose-lose', which would be a tragic outcome for the global community.

Cambridge, United Kingdom
June 2022

Professor Peter Nolan

Preface

This extended brief is for policymakers navigating the twenty-first-century tectonic shift caused by climate change and artificial intelligence or AI. Both forces are global, and without global collaboration and coordination, humanity is unlikely to steer either trajectory to ensure its safety and benefit. However, global governance experiences one of its deepest crises since the Second World War. This crisis manifests in the heightened demand for sovereignty, which has crossed the line of protectionism and relapsed into technological and ideological silos. Reinforced by the global pandemic and Russia's War in Ukraine, such regression has already severely damaged the global value and innovation ecosystem that resulted from decades of liberal transformation. The limited sustainability of capitalist globalization and the seemingly irresolvable clash between the United States and China are the primary cause of the current crisis of global problem-solving.

The purpose of this policy brief is to deepen the understanding of today's global governance gap and return of sovereignty by revisiting the conditions and drivers that had sustained national telecommunications monopolies for most of the twentieth century and that eventually led to their disintegration in the 1980s and 1990s. The brief initially focuses on the telecommunications sector, as its transformation was symptomatic for all other state-owned sectors in the West. After its liberalization, telecommunications experienced unprecedented technology innovation and contributed to tremendous development and growth. To better grasp the potential development of AI, the brief argues that the Internet revolution was not the sole driver of change, as well as highlighting how China was able to break through the asymmetrical distribution of technological capabilities and institutional power between the West and the developing world and eventually become a leader in mobile communications and digitalization.

Against the backdrop of telecommunication history, it becomes clear that today's strong demand for digital sovereignty historically resembles the 'great re-regulation', not just of the telecommunications sector but the entire emerging digital economy and its disruptive technologies. Without creating new state monopolies, this 'great re-regulation' is a response to the limits of unfettered global markets and attempts

at preventing a new golden straitjacket, not of hyper-globalization, but of hyper-digitalization. Moreover, the brief also argues that the return of sovereignty is a response to fierce global competition and the decline of the Western control over existing multilateral and multistakeholder institutions and key technologies. While the United States had dominated key technologies and markets at times of both state monopolies and the early rise of the Internet, AI's tremendous potential as a new source of efficiency is not a prerogative of the United States or the West. Unlike the Internet, which was celebrated as a necessary outcome of liberal democratic capitalism, AI is utilized within any political system and, from the beginning, is perceived not just as an opportunity, but as a source of unprecedented risks.

To advance understanding of the underlying causes of today's return of sovereignty, this brief closely analyzes the limits of hyper-globalization, the rivalry between the West and China and China's otherness. It poses the question: to which extent China can be regarded as a democracy? Whereas a healthy world order rests on healthy national economies and societies, this policy brief finds that reformation of global governance remains vital for effective global problem-solving and cannot be achieved through a rise in bilateralism and plurilateral groupings. This applies to AI and the prospects of intelligent decarbonization. Neither the West nor China can travel back in time but must engage in smart diplomacy to realize the potential of technology for the benefit of society and nature and to effectively mitigate the disruptions of AI and climate change.

Berlin, Germany

Thorsten Jelinek

Introduction

Two of the most important imperatives of the twenty-first century, climate change and artificial intelligence, pose a grand challenge for humanity. The massive impact of climate change is unmistakable in the wake of recent natural disasters, extreme weather events, rising sea levels and biodiversity loss. With AI, the potential threats remain less urgent. However, as capabilities and the adoption of algorithms develop, humanity is bound to witness a fundamental transition accompanied by risks that have only recently entered the public discourse. The disproportionate risks associated with AI, however, may well outweigh its benefits.

For policymakers navigating the challenges of climate change and artificial intelligence, success means a carbon-free economy that incorporates climate policies that incentivize the prevention and reduction of climate change risks and a digital economy that fairly distributes the benefits of responsible AI while ensuring human dignity and the control over intelligent automation and dilemma optimization. However, policymakers are confronted with a governance gap that undermines not only the effectiveness of climate action, but also that of responsible AI. Meanwhile, as a response to the crisis in global governance, the global political system has resorted to territorial and digital sovereignty. For now, the emerging multipolar world is not a solution for a more inclusive and just world order but has rather become a threat to both global and national governance and decision-making.

The problem is not one of sovereignty or the right to make independent policy choices, but rather the fine line separating the demand for sovereignty from a regression toward the era of technological and ideological silos that persisted for most of the twentieth century. Today's governments of the leading economic regions have already crossed that line, resulting in market protectionism and technology nationalism and eroding much-needed international collaboration and coordination. This regression has already severely damaged the global innovation and value ecosystem that emerged from the Internet revolution and liberal capitalist transformation in the 1990s and 2000s. The liberalist transformation triggered unparalleled innovation, growth and development that led to the convergence of information and communication technologies and made mobile communications the fastest adopted technology in history and the backbone of today's rapid digitalization. However, the same liberal

capitalist forces have reached their limit, erupting in today's prolonged deadlock in global collaboration, which is manifested in the power rivalry between the United States and China. COVID-19 and Russia's War in Ukraine have dangerously accelerated and made fully visible those developments. And yet, no government seems to know how to overcome the global governance gap and reform the global political system of cooperation and problem-solving.

In revisiting the history of telecommunications, this policy brief argues that a return to technological and ideological silos is entirely insufficient for facing the challenges of the digital transformation and climate change. Rediscovering that part of history will help to develop a better understanding about the geopolitical tension around the fifth and, the already emerging, sixth generation of mobile communications networks (5G and 6G), which epitomizes current tensions between the West and China. It also helps to sharpen understanding about the foundation of today's digital transformation and disentangle the current deadlock related to the crisis in global governance and the heightened demand for sovereignty. By focusing on cybersecurity and privacy protection, digital sovereignty has its merits for building an environment that safeguards participation in digital markets, improves their trustworthiness and increases confidence in the digital future. However, in the current context, the emphasis on national and economic security, which is at the center of today's demand for sovereignty, risks resurrecting technological and ideological silos and preventing much needed and more effective global collaboration on artificial intelligence and climate change.

To accomplish the goal of this policy brief, Chap. 1, "The Rise and Fall of the 20th Century Technology Silos", takes the reader back to the period of regulated telecommunications monopolies that lasted in the United States from 1913 to the 1980s and in Europe until the 1990s. This section recalls how the system of regulated monopolies was sustained through rent-seeking, cartelistic arrangements and government favoritism on a national level and how this closed system was reinforced through Western domination and control at the international level. The initial chapter then analyzes how the liberal transformation in the West between 1970s and 1990s gradually dismantled the telecommunication monopolies and how the United States managed to retain its institutional dominance and technological leadership during the transformation toward the newly created open information and communication technology (ICT) world. This transformation gave birth to an international innovation and value ecosystem and to multistakeholderism dominated by the private sector. The Internet was seen as something that was intrinsic to and would help spread liberal democracy globally. However, such technology optimism no longer exists today. It has become replaced by technology realism and even dystopian scenarios associated with widespread adoption of advanced AI.

Chapter 2, "Breaking Through Post-colonial Dependencies", reminds the reader that the technological hegemony of the West and its institutional domination on an international level reproduced the hierarchical relationship between the West and the developing world that is reminiscent of the West's colonial past. Less developed countries benefited from Western technology, but the asymmetrical arrangement effectively prevented the Global South from acquiring its own nascent telecommunications

technology. The International Telecommunication Union (ITU) played a significant role in legitimizing state monopolies and sustaining the Western dominance over the developing world. The exception to this and discussed at some length was China, which subsequently managed to break through Western domination to become an innovator and global leader in mobile communications. The rise of China's telecommunications sector is symptomatic of the relative decline of the Western control over technology and existing multilateral and multistakeholder institutions. It also exemplifies how poor countries are restricted from becoming rich or aligning with Western living standards when they mainly rely on market forces.

Chapter 3, "Technology Silos of Today or the End of Global Innovation", brings the reader back to the present and discusses the rationale and implications of the crisis in global governance and the return of sovereignty, with the demand for digital sovereignty as its primary strategic direction. For readers of the history of telecommunications, Chap. 3 clarifies how the return of sovereignty historically resembles the 'great re-regulation' after the initial regulation and deregulation at the turn and at the end of the past century, respectively. This is not just the re-regulation of the telecommunications sector but the entire digital economy and its disruptive technologies. Western governments don't seek to re-establish state monopolies but want to control and safeguard their emerging digital economies. They justify their measures based on national and economic security, fierce global competition and value-driven foreign policies. However, the heightened demand for sovereignty has crossed the line of protectionism and relapsing to technology silos, which today manifests in the geopolitical rivalry around 5G and a fierce innovation race toward 6G. Unlike with previous mobile network generations, the research and development of 6G already lacks any collaboration between the West and China and signals a hard-break of the global innovation ecosystem. The United States has executed a whole-of-government approach to boost its technology competitiveness and contain China's development. Pressured by the United States, Europe balances between an outright ban of Chinese mobile network infrastructure and raising its cybersecurity and privacy standards, which also discriminate against U.S. technology companies. While the West seeks to decrease its dependency on China, China has intensified its own pursuit of cyber sovereignty and technology self-sufficiency.

In Chapter 4, the reader is immersed in "The Transformation of Our Time", driven by climate change and AI. Although both issues are very different in nature, their level of scope and impact makes it necessary to address them together. A successful transition would mean that a carbon-free economy is grounded on climate policies that incentivize the reduction and prevention of climate risks and damages and an inclusive and trustworthy digital economy that fairly distributes the benefits of responsible AI and ensures human control over ubiquitous automation across national borders. Chapter 4 also discusses how climate action and responsible AI face a seemingly insurmountable governance gap, which undermines the possibility for effective collaboration directed by common goals and principles. While intelligent decarbonization can help accelerate the process of decarbonization, an overreliance on technology has already falsely suggested easy technology solutions for complex

problems and kept climate action on a failing trajectory. It is political will, rather than technology, that will enable effective risk mitigation and prevention.

Chapter 5, “Race to the Bottom”, takes the reader a step further and dissects the Sino-West relationship, which has regressed over the past decades from presumptuous optimism to containment. Both sides have taken more risks in mutual confrontation. The re-emergence of technological and ideological silos cannot be understood properly without analyzing the rivalry between the West and China. The big power rivalry has become cause and effect of today’s crisis in global governance. Hence, Chap. 5 discerns the key differences and commonalities between China and the West as they face the disruptive limits of global capitalism but address those challenges from diametrically opposed positions. Systemic differences and fierce competition over technology leadership keep both sides on a collision course. The Western discourse on decoupling does not help to reform global capitalism but reinforces the heightened demand for sovereignty.

Chapter 6, “Recommendations for Policymakers”, concludes the brief and distills key insights from the previous liberalist transformation relevant to understanding today’s tectonic shift driven by AI and climate change. Chapter 6 offers a set of recommendations about the necessary reform of global governance and reemphasizes the importance of multilateralism as a counterweight to sovereignty. To mitigate risks attributed to AI and avoid a return to technological and ideological silos that exacerbate the crisis in global problem-solving, a global coordinating committee for AI governance is proposed. The overall purpose of this brief is to contribute toward re-establishing a foundation for discussion and dialog that can help arrest a hardening of opposing fronts as humanity faces the grand challenges of climate change and AI-driven digital transformation.

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Chapter 1

The Rise and Fall of the 20th Century Technology Silos



Telecommunication is a key enabling infrastructure for digitalization and development. Thus, to better understand today's heightened demand for territorial and digital sovereignty it is worthwhile to revisit the history of telecommunications. In the United States, where both telegraphy (1838) and telephony (1875) were invented, the telecommunications sector emerged as "competitive chaos," "with many firms competing to provide basic exchange services," until the American Telephone and Telegraph Company (AT&T) legally became a monopoly. AT&T's monopoly lasted from 1913 to 1984 [1]. In the U.S., the general economic belief was that only one national operator could ensure affordable telecommunication services and increasing returns of scale to recover the high capital and operating expenditures associated with developing and running a national telegraph and telecommunications network. This belief did not only apply to the telecommunication sector, but to any other strategic infrastructure, such as energy or transportation. Most other countries during that time also operated monopolies in postal, telegraph, and telephone (PTT) services.

1.1 A Robust System of Telecommunications Monopolies

As long-term obligatory cooperation emerged between national PTTs and one or a few specialist technology suppliers, the former operated old circuit-switched networks, while the latter produced proprietary telecommunications equipment that was incompatible with the networks of other countries. Some of the equipment suppliers, including companies as Western Electric, Siemens, Alcatel, ITT, NEC, and Fujitsu, were initially subsidiaries or central research laboratories of the "Big Five" incumbents, namely, AT&T, British Telecom, Deutsche Telekom, France Telecom, and Nippon Telegraph and Telephone. Both the monopoly operator and its supplier formed a quasi-vertically integrated supply chain. Domestically, there was no competition. The monopoly operator was locked in by their technology providers, which had

been accorded a privileged supplier relationship. All participants and new entrants were strictly controlled by the government and shielded from outside pressure [2: 9].

Within those big five countries, innovation was restricted largely to operators and their research laboratories or favored suppliers. The innovation system was a closed one with high entry barriers and suppliers had exclusive access to the networks. The research and development (R&D) process was slow, sequential, and weakly incentivized by non-market dynamics. The result was a fragmented and proprietary knowledge base [cf. 2: 39]. However, there was competition on an international level, but only between a few countries, mostly Western ones, including France, Germany, Japan, the United Kingdom, and the United States. This Western group of technologically self-sufficient countries and their respective equipment providers dominated the international telecommunications regime. Thus, in other, mainly smaller and less developed countries, equipment markets were not limited to national suppliers with favorable supplier relationships with their national operators, but telecommunications administrators had to procure equipment from the handful of Western specialist technology suppliers [2].

Within this monopolistic environment, prices for telecommunication services were determined not by market dynamics, but administrative fiat. While domestic prices were sporadically adjusted based on public pressure or political capital seeking, international connection services proved more insulated from those pressures and thus priced substantially above their operational costs. Those profits enabled operators to subsidize local or regional connections and offer them at an affordable price. In addition to such cross-subsidization, financial resources were obtained from governments to support infrastructure development towards the provision of universal service, that is, quality services at just, reasonable, and affordable tariffs.

The International Telecommunication Union (ITU) played a significant role in legitimizing the West's monopolistic structure on an international scale and in maintaining its monopoly for a period of 120 years—from its establishment in Europe as the International Telegraph Union in 1865 through its second incarnation as International Telecommunication Union from 1932 until the 1980s. The ITU was mainly responsible for technical questions concerning the effectiveness of telecommunication, allocation of frequencies, and regulation of international telecommunication services, which enabled highly profitable cross-country, long-distance traffic. Western member states and their technologically advanced PTTs (compared to non-Western states) dominated the ITU, its procedures, regulations, and budget. Although the ITU “fully (recognized) the sovereign right of each country to regulate its (own) telecommunication” [3: 281], the West set the international agenda for standards and regulation and represented their national operators as a “natural monopoly”—a term that was popularized in the U.S. around 1920 suggesting that competition in telecommunications was “duplicative,” “destructive,” and “wasteful” [4: 274]. Although this appears ironic in light of the liberal turn towards the end of the twentieth century, the ITU's multilateral framework helped reinforce national monopolies and bilateral agreements between the developed West and less developed countries, which “created one of the most lucrative and technologically significant international cartels in history” [1: 169, cf., 2, 5].

The past monopolistic era spanning most of the twentieth century was sustained due to mutually reinforcing interests based on rent-seeking arrangements, which relied on the pursuit of benefits created by government favoritism on a national level and was legitimized and reinforced at an international level. This system resisted looming changes brought by disruptive technological changes and subsequent political manifestation of liberal values. Nevertheless, in the West, monopolistic practices led to near ubiquitous telecommunication networks, high telephone density, and industrial development. Despite the West's institutional dominance and technological leadership, which sustained an asymmetrical distribution of power and suppressed the acquisition of knowledge for building a native technology industry, less developed countries also benefitted from Western technologies and could develop their own monopoly operators. In this view, the essential questions that arise are: why could this prolonged model of state intervention and regulation resist the technological changes that would radically challenge existing hierarchies by generating new opportunities and sources of efficiency, and did the Internet revolution make the deregulation and liberalization of the old monopolistic structure inevitable? Considering the reemergence of territorial and digital sovereignty, which further risks regressing to ideological and technological silos, those questions are highly relevant today and are addressed in turn.

1.2 The Gradual Breaking up of Silos

The liberalization of the telecommunications industry heralded the end of monopoly operators and resulted in a profound reconfiguration of the industry and an era of unprecedented innovation, economic growth, and development. This paradigm shift did not happen overnight. Rather, it lasted a few decades and was a struggle of innovation, adaptation, resistance, litigation, as well as changing values, political priorities, and policies, which eventually led to a series of major reforms. Those changes happened first on the national level and then on the multilateral level. Those reforms or “big bangs” legally manifested the ongoing liberalist transformation that had already disrupted the industry prior to its reform. To varying degrees, liberalization largely meant the privatization of public monopolies and their vertical disintegration; market deregulation and the promotion of competition and; the protection of consumer rights [1].

In more detail, the liberal transformation gained momentum in the late 1980s and 1990s. It was the time of the collapse of the Soviet Union, which reconfirmed and strengthened the neoliberal opposition of Ronald Reagan and Margaret Thatcher to the failed social democratic politics of state intervention. The U.S. had already witnessed the commencement of deregulatory steps between the 1960s and 1970s, which took shape during the antitrust lawsuit filed by the United States government against AT&T in 1974, which led to its breakup into regional operating companies in 1984 [1]. Not long after, the monopoly in operating telecommunications was removed in the United Kingdom (1984) and Japan (1985). In the old social democracies of

France and Germany, deregulation occurred 10 years later with the European Union Directive to abolish all monopolies in telecommunication services and networks by January 1998.

The liberalist transformation empowered “specialist technology suppliers,” such as Alcatel, Siemens, NEC, Fujitsu, Cisco, Ericsson, Nortel, Lucent, and Nokia, which were already selling their products internationally. As a result of the removal of market entry barriers, incumbent operators left R&D to those specialist technology suppliers. In turn, the incumbent operators became dependent on procuring equipment and software from those suppliers. This led to vertical technology specialization and further division of the supply chain. Consequently, the R&D ratio of the incumbents shrank significantly, while the R&D intensity of the new group of specialist network and equipment providers increased tremendously. The deregulation also opened an entirely new market for service providers, like WorldCom, Qwest, Level 3, and Global Crossing, which did not operate any networks but exclusively offered services and whose R&D spending was even lower than that of the incumbents. By 2000, AOL became the largest web portal and Internet service provider in the world. During that time, the transition was a tremendous challenge for all market participants. Each actor, including the technology providers, needed to understand their position in newly emerging and increasingly global demand and value chains, and to re-evaluate their strategies, business models, and revenue streams. Eventually, the deconstruction of the telecommunications sector gave birth to the information and communications technology (ICT) industry.

Liberalist policies transformed the old monopolistic telecommunications industry into a globally distributed innovation and value ecosystem. An essentially closed-off learning system turned into an open one, with lower entry barriers, numerous innovators, and multiple entry and exit points for collaboration and value creation. International market forces, including co-evolving consumer preferences, provided new incentives to foster a process of rapid and concurrent innovation, new business models with differentiated services and revenue streams, all of which leveled a tremendous impact across major industries. R&D outsourcing together with Internet technology led to a common global knowledge base and the global standardization of core technologies over country-specific proprietary systems [cf. 6].

This paradigm shift was largely enabled by new incentives and choices made possible by the Internet and the invention of time-shared computers and packet-switching in the early 1960s, the Internet Protocol (IP) and Transmission Control Protocol (TCP) in 1978, and the World Wide Web in 1990. Essentially, the separation of software from hardware made services and applications independent from physical equipment and networks, which created an entirely new industrial category of “facilities-less” and “vertically-specialized” service providers. Tim Berners-Lee’s invention of the World Wide Web further enabled and accelerated the commercialization of the Internet. In the U.S., where packet switching and the Internet was most rapidly deployed, the private sector was eager to harness the benefits of the new technologies and respond to increasingly diverse preferences due to rapid technology

penetration and a rising user base. Exerting more pressure towards incumbent operators and demanding further deregulation, the private sector advanced as new technologies inflicted loopholes in the exiting national and international regulative regime, which could neither account for new technologies and services nor match the speed of technological change. Gradually, the existing monopolistic structure proved unsustainable both economically and politically. The incumbent's rent-seeking model, which was fed and sustained by returns of scale and cross-subsidization, increasingly came under fire.

By using leased lines, packet switching enabled connections between mainframe computers—mainly from IBM or DEC—to run private voice or data networks used by transnational corporations (TNCs). As TNCs were globalizing, the demand for, and the traffic on, those private networks rapidly increased. For inter-site telephony, private phone networks essentially allowed corporations to bypass publicly switched telephone networks (PSTNs). As voice accounted for most of the traffic at that time, running the service on a private instead of a public network meant cost savings with increasing usage particularly in the context of overpriced international connections. Providers of private networks were thus competing against incumbent operators who felt the pressure of ever-decreasing connection fees. In the U.S., the cost for a three-minute long-distance phone conversation was \$50 in 1955 (adjusted for inflation), and fell to \$1 by 1998. Moreover, the marginal costs of sending the same content by email were less than 20 cents at that time [7]. In addition to significant cost savings, private networks also offered enhanced, reliable, and secure data services, which public networks did not offer.

Those new cost advantages were especially important to the banking industry. One of the largest shared private networks was run by the Society for Worldwide Interbank Financial Telecommunication (SWIFT), “which by 1990 [...] linked 3049 financial institutions in 84 countries” [8: 10]. It is therefore no wonder that incumbent operators insisted on regulations and standards prohibiting connections of private lines to conduct public switches; banning independent equipment; or requiring official PTT equipment for initial connections [1, 6, 9]. Once the Internet took off and voice over IP (VoIP) became available from the mid-1990s, private networks for voice and data services started converging and became connected to the public Internet through the point of presence offered by Internet service providers (ISPs). Essentially, it was packet-switching that would not only spell the end of nationalistic monopolies with cartel-like interactions, but also disrupt and propel the global economy beyond the telecommunications industry. Eventually, it would give birth to a zero marginal cost economy disrupting entire supply chains and industries.

The introduction of packet-switching and TCP/IP was also met with resistance. As national economies grappled with the impact and direction of artificial intelligence (AI) and Web 3.0, policy and decision-makers also wrestled with packet-switching and TCP/IP transformation. On the shift from circuit to packet switching, monopoly operators, notably AT&T, were initially not very interested in this new technology: “ARPA approached AT&T in the early 1970s to see if AT&T would be interested in taking over the ARPANET and offering a public packet switched services, but AT&T declined” [10: 1310]. It should not come as a surprise that private technology

companies, such as IBM and DEC, exploited this opportunity. With the invention of the TCP/IP, the experience was similar. In the words of Vinton Cerf, one of the fathers of the Internet: “We now know that the lift-off points for exponential growth [on the Internet] came around 1988, though it wasn’t obvious at the time [...] My first reaction was something like, ‘Holy Shit!’” [in 2: 35]. What delayed the adoption of the Internet was a “standards war” between TCP/IP and the Open Systems Interconnection (OSI) reference model. Governments of almost every country opposed Internet adoption or would not fund R&D for Internet technologies. They viewed the Internet as a non-standard US technology and rather favored several connection-oriented protocols that dealt with the connection problems brought by the proprietary networks. Even in the U.S., there was resistance towards Internet technology. Notably, the Government OSI Profile (GOSIP) directive required that US government computers were OSI compliant [11].

Ultimately, technological advantages led to the victory of the Internet as a de-facto standard. Whereas the OSI reference model was heavyweight with built-in barriers to interoperability and its implementation was cumbersome, Internet technology was lightweight, enabling rapid implementation, community-driven innovation, and iterative code testing for error reduction and interoperability. The price-performance-ratio was more beneficial with respect to the Internet standard and its connection-less approach compared with the OSI standard and its connection-oriented approach. The latter was more resilient but also more expensive and primarily only repaired, rather than revolutionized, the old proprietary systems. Moreover, while OSI was developed in 1983 and adopted by the International Organization for Standardization (ISO) in 1985, TCP/IP had already come into widespread use on multivendor networks and as the core component of the emerging Internet. In addition, the US National Science Foundation (NSF) and the Defense Advanced Research Projects Agency (DARPA) continued their R&D support for some time. Werner Zorn, the father of the German Internet, argued that the European governments’ adherence to OSI and prolonged rejection of TCP/IP until the 1990s was among the key reasons why the private sector in the United States accumulated long-term benefits from the Internet. Europe had simply lost an important time advantage. The World Bank recently highlighted Europe’s structural competitiveness gap within the digital industry [12].

The gradual rise of the Internet and the manifestation of liberal values eventually led to a reversal of the relationship between state and private sector. Direct state intervention became delegitimized. In the U.S., the government started utilizing its competitive advantage and mobilized its private sector and transnational corporations to drive international growth and determine telecommunication and Internet standards [13]. The United States Telecommunications Act of 1996 was the legal manifestation of the technological realities and liberal policies introduced over the previous three decades, especially under the Reagan (US) and Thatcher (UK) administrations. One of the major goals of the Act, which was signed by then President Bill Clinton, was to increase competition and “accelerate the deployment of an advanced capability that will enable subscribers in all parts of the United States to send and receive information in all its forms—voice, data, graphics, and video over a high-speed switched, interactive, broadband transmission capability” [14].

Hence, the Act was already strongly leaning against the new Internet era. In addition, the creation of the Internet Engineering Task Force (IETF) for standardization and the Internet Corporation for Assigned Names and Numbers (ICANN) for administration as private multistakeholder institutions in 1986 and 1998, respectively, not only reflected the new dominance of the private sector, but also signaled the interest of the government to control the newly emerging Internet regime in the same way it had controlled the old telecommunications regime.

1.3 Drivers of the Liberal Transformation

The Internet is what Joseph Schumpeter would have called an “engine of change”, leading to the “creative destruction” required by capitalism to renew and enhance itself. However, this should not suggest that the liberalization and deregulation of the telecommunications industry starting from the 1970s was a consequence of such groundbreaking technological change [13, 15]. Technology constitutes a fundamental driver creating new opportunities and changing the distribution of power, and as a human artefact, its impact is a manifestation of human relations and choices. Regulators, managers, and users need to make choices with some choices being strongly influenced by new technology opportunities; thus, generating more advantages that, in turn, lead to other choices and thereby influencing the distribution of power. As such, the Internet has made possible a new range of choices that occurred within the existing system of state power and economic structure, which was dominated by the U.S. and its alliance partners and increasingly based on neoliberal values and policies [13: 166 pp].

Without doubt, the widespread adaptation of the Internet and its decentralized architecture undermined existing political, industrial, and societal hierarchies, thereby altering the distribution of power. Nevertheless, the new opportunity was largely driven by the incentive of capitalist expansion, by new sources of efficiency and growth, along with a tremendous increase in market participants as well as technology and service consumption. As Drake [13: 167] concluded, drawing on Schumpeter: “The driving force in the transformation of national and international telecommunications institutions derive[d] from the economic sphere [while] private capital accumulation helped to undermine the legitimating conditions of monopoly regulation [thereby] reversing the historical relationship between the political and economic spheres.” Such a reversal meant the delegitimization of state intervention and the legitimization of neoliberal values and policies, which required a rearrangement in terms of the preexisting balance of power between state and the private sector; state and international organizations; and between states. Such rearrangement was accomplished through negotiation as well as political and economic coercion, primarily carried out by the U.S. government in partnership with U.S. multinational technology corporations. The rearrangement happened not only on national, but also on bilateral and multilateral levels.

In particular, the U.S. and U.K., neoliberal policies became the dominant response to the economic stagflation and the bureaucratic inefficiencies of the 1970s and 1980s. Ronald Reagan's famous dictum, certainly shared by Margaret Thatcher, best summarized the underlying conviction of the neoliberalist turn: "Government is not the solution to the problem; government is the problem." In 1989, the fall of the Berlin Wall and the collapse of the Soviet Union further affirmed and legitimized the turn towards market foundationalism. The "Washington Consensus", as coined by the economist John Williamson [16], which was strongly influenced by the International Monetary Fund (IMF), symbolized U.S. neoliberal policy prescriptions for international development. According to Dani Rodrik, the Washington Consensus "inspired a wave of reforms" and "fundamentally transformed the policy landscape." Not only less developed countries, especially in Eastern Europe and Latin America, but also the former socialist countries "made a bold leap towards markets" [17: 973–4]. The ten pillars of the Washington Consensus advocated fiscal discipline; redirecting public expenditure; tax reform; financial liberalization; adoption of a single competitive exchange rate; trade liberalization; elimination of barriers to foreign direct investment; privatization of state-owned enterprises; deregulation of market entry and competition; and secure property rights [18]. In Europe, a weaker form of neoliberalism manifested as the "Third Way"—a *realpolitik* and more market-oriented social democracy [19]. In short, the U.S. advocated the market more than Europe did, but both agreed that the market was a remedy for the Keynesian policies of the 1970s and 1980s that had collapsed into a disorder of austerity programs that ultimately failed to fulfil the expectations of the Western welfare state.

This broad transformation, which was largely gradual and iterative, took place on national, bilateral, and multilateral levels as the U.S. vigorously sought to maintain its hegemony in the new neoliberal world order that it had created in the post-WWII era. This process ultimately delegitimized regulated monopolies and legitimized open markets and liberal trade of telecommunications services. On the one hand, Western governments, to varying degrees, continued to protect their operators from the gathering market forces. Yet, they were increasingly challenged by their own operators, who tended to reject the new demands to protect their shrinking shares in the telecommunications industry. Meanwhile, the governments of less-developed or late-developing countries were also clinging to their monopolies and protecting their markets. On the other hand, the rapidly growing private technology sector—which was marketing its products in the arena of the disrupted network and applications layers and newly emerging service layers—saw their bargaining power increased and pushed for more liberal policies and a more competitive telecommunications industry. The private sector sought to harness the benefits of the new technologies and to respond to increasingly diverse preferences of the rapidly increasing technological penetration and the rising number of users. Exerting more pressure towards deregulation, the private sector gained market advantage as the new technologies inflicted loopholes in the exiting national and international regulatory regime, which failed to account for new technologies and services or match the speed of technological change.

Gradually, the existing monopolistic structure proved unsustainable politically and economically, which led to the reversal of the relationship between state and the private sector. In the U.S., the government utilized its competitive advantage and mobilized its private sector and transnational corporations to drive international growth and determine telecommunication standards [13]. The U.S. Telecommunications Act of 1996—which took years of debate before its passage and was signed into law by Bill Clinton—legally manifested the liberal policies that had been subsequently introduced over the past two decades in the U.S. It represented the first major reform of U.S. telecommunications law in more than 60 years and formally promoted competition by reducing regulations and encouraging the rapid development of new telecommunications technologies. One of the government’s major goals for the new Telecommunications Act was to increase competition and “accelerate the deployment of an advanced capability that would enable subscribers in all parts of the United States to send and receive information in all its forms—voice, data, graphics, and video over a high-speed switched, interactive, broadband transmission capability” [14]. However, the new Act was also seen critically as the birth of “a new cycle of rent seeking and rent extraction by government and industry factions,” a new public–private arrangement to extract rent largely by means of controlling content with respect to: broadcasting and spectrum allotment; new bureaucracies redistributing wealth; price discounts for designated consumers; and prospective tax legislations [5: 277].

The old U.S.-controlled Bretton Woods Institutions—the IMF and the World Bank—were already promoting global market liberalization and making domestic-market reforms a condition for less-developed countries seeking to receive development support. The Washington Consensus, as highlighted above, clearly shared the same objectives. To push the neoliberal agenda on an international level and create a strong conceptual bias towards global market liberalization, the U.S. government added telecommunications to trade negotiations at bilateral, regional, plurilateral, and multilateral levels and “launched a multipronged diplomatic offensive” from the mid-1980s onwards [13: 170].

1.4 The Rise of Multistakeholderism

On a bilateral level, the U.S. government has utilized its power to force open foreign markets through bargaining, preferential arrangements with liberalizing countries and trade threats. The U.S. objective of access negotiation was predominantly to engender an environment that is like that within the U.S. The bilateral level was the preferred level of negotiation, especially when the multilateral framework was considered slow and restrictive [9]. On the one hand, US bilateralism diminished the role of international institutions, and on the other, it paved the way for a more favorable environment for liberal policies, negotiated at the regional and multilateral levels, to be adopted. On the regional level, the U.S. realized various favorable trade agreements, and the launch of the European Community’s single market in 1993

signaled a major break with the past regime of nationally regulated monopolies. On the plurilateral level, the OECD was particularly instrumental on a conceptual level. In the early 1980s, the organization analyzed the barriers in telecommunications to develop for its member states a multilateral framework for trade in services, including telecommunications services.

On the multilateral level, two larger rounds of trade negotiations featured deliberation over telecommunications services, the first from 1986 to 94 (Uruguay Round) and the second from 1994 to 97 (post-Uruguay Round). With the creation of the General Agreement on Tariffs and Trade (GATT) in 1947, the U.S. had already pushed for international trade liberalization, largely obstructing tariffs, and enacting anti-dumping measures. Then, from the 1980s, the U.S. concentrated on the liberalization of the global market for services, including telecommunications services. Initially, this was done as part of the General Agreement on Trade in Services (GATS) which was negotiated under the GATT Uruguay Round (1986 and 1993), leading to the creation of the first global trading and streamlined dispute-settlement system—i.e., the World Trade Organization (WTO). Based on the completion of the Uruguay Round, from 1994 to 1997, the WTO members then negotiated market access to “basic telecommunications services” within the GATS framework. A commitment was reached by 69 member governments accounting for 90% of the global telecommunications revenue. While the GATS Uruguay Round focused on value-added services (e.g., online data processing, online database storage and retrieval, electronic data interchange, email, and voice mail), the WTO negotiations focused on basic telecommunications services (e.g., voice telephony, data transmission, telex, telegraph, facsimile, private leased circuit services, fixed and mobile satellite systems and services, cellular telephony, mobile-data services, paging, and personal-communications systems, as well as establishing a regulatory authority; safeguarding against anti-competitive practices; requiring major suppliers to interconnect with other suppliers and; administering universal service programs) [20]. The WTO agreement was incorporated into the GATS and entered into force in 1998 with obvious far-reaching implications for the global telecommunications sector. After the successful conclusion of those multilateral negotiations, regional trade agreements (RTAs) with telecommunications and ICT provisions have been vigorously fortified. While many RTAs refer to the GATS, a strong increase was also seen in terms of new and highly heterogeneous telecommunications provisions not covered by the multilateral agreement [21].

The regional and multilateral trade negotiations, starting with the GATS Uruguay Round, bypassed the ITU simply because the ITU, as mentioned above, was not mandated to negotiate trade-related agreements in telecommunications or address questions concerning redistribution. Nevertheless, trade negotiations successively created an international environment that also forced ITU to support trade liberalization. Thus, by the end of the 1980s, special ITU arrangements from the early 1980s were transformed into ITU treaty changes, promoting a shift towards multi-vendor and user-oriented telecommunications markets. The incumbent operators could no longer take refuge behind old treaties that had legitimized monopolistic structures (Drake 178). This transformation also rendered a profound impact on

the industry's standardization regime. Due to the prolonged control of the incumbent operators or PTTs in the Comité Consultatif International Télégraphique et Téléphonique (CCITT)—the old technical committee of ITU, which today is called ITU-Telecommunication Standardization Sector (ITU-T)—the adaption of new standards remained sluggish, while the technology was growing more complex and open. Consequently, the private sector turned to alternative standards setting bodies, whose number and diversity of players, in terms of standardization, were increasing due to liberal forces and technology convergence. The new players included the American National Standards Institute (ANSI), T1 committee of the National Exchange Carriers Association (NECA), and Corporation for Open Systems (COS) in North America; the Technical Telecommunications Committee (TTC) in Japan; or to the European Telecommunications Standards Institute (ETSI) and the European Standards Commission (CEN), and other industry-oriented groups. Innovation became less about privileged access, but more about an outcome of market competition along with the best possible technological approach.

Finally, in the cause of the neoliberal turn, multistakeholderism became the symbol of the new “open” world with institutions emerging bottom-up from societal deliberations that primarily engaged networks of private businesses, research institutes, and universities. The market and leading technologies defined future standards, and no longer a handful of technology specialists that had privileged access to monopoly networks. In the economy, multistakeholderism signaled the redistribution of power from the state to the private sector. The U.S. government started promoting multistakeholder institutions, such as the Internet Corporation for Assigned Names and Numbers (ICANN) and the Internet Engineering Task Force (IETF), but also those that focus on mobile communications and standardization bodies, including the Institute of Electrical and Electronics Engineers (IEEE), Alliance for Telecommunications Industry Solutions (ATIS), and later the 3rd Generation Partnership Project (3GPP). All multistakeholder institutions, related to key technology areas, originated in the U.S. and quickly turned into global multistakeholder institutions that greatly contributed to the advancements and widespread adaption of Internet technology and mobile communications. However, it soon became clear, as Neyer critically puts it [15: 16], that those institutions “were hardly more than a camouflage” and their openness a “false promise.” They mainly served U.S. interests and helped to sustain the dominance of U.S. multinational corporations and Big Tech industry, while U.S. domination of the telecommunications sector was increasingly fading.

Market liberalization and the internet revolution turned telecommunications into a critical steppingstone towards enabling a globally converged innovation ecosystem that would become a driving force behind digitalization, impacting all aspects of business and daily life. However, as the previous section implied and the next section highlights, modern technology does not intrinsically promote openness and liberal values but has been utilized to reinforce or reproduce an existing distribution of power. Technology is not responsible for, but has facilitated as the determining force of modernization, the reproduction of an existing asymmetrical relationship between the West and the developing and late-emerging world—apart from China.

Chapter 2

Breaking Through Post-colonial Dependencies



Capitalism has elevated technology as a powerful utility that has also divided the world into rich and poor. Harvard Professor Dani Rodrik [22, 23] has shown that market mechanisms alone are not sufficient to transform a poor country into a rich one. It requires state intervention, including the development of human capital, robust institutions, and modern industries. Yet, institutional or market failures have high set-up costs that are borne disproportionately by modern industries [23: 92]. Rodrik also stresses that only a handful of countries greatly benefited from the existing Western system, witnessing “exceptional growth” and “more rapid convergence with the living standards of the West” after WWII.

Almost all the successful Asian manufacturing economies, including Japan, South Korea, and the so-called East and Southeast Asian tigers, started out with protected home markets. Yet, they managed to increase their technology capabilities, economic factors, policies and institutions, which quickly enabled their catch-up transition towards an efficiency- and innovation-based economy. They “built highly competitive manufacturing industries and experienced very rapid penetration of export markets in manufacturing” [22: 25] and effectively emulated the West’s own past transition without the West’s first-mover advantage. However, for many other low-income countries, despite their “late-mover advantage,” such convergence still has not materialized. In addition to market and institutional failures, another key reason is that “technology adoption and spillovers have usually remained under the control of the foreign multinationals that govern the supply chains” [22: 25, 46]. What remained is an asymmetrical distribution of power and structural dependency between the developed and the less developed world, except for a few Asian countries, notably China, in telecommunications.

2.1 Western Hegemony in Telecommunications

The history of the telecommunications industry largely confirms Rodrik's observations. It also shows that the West's own aspirations for technology leadership and economic growth translated into the domination and control of international markets and intuitions, which sustained a post-colonial hierarchy and dependency, and prevented less developed countries from overcoming their structural gap. However, less developed countries benefited from the West and were able to establish their own "natural monopolies." While their own national industry was largely shielded from external competition, the "Big Five" Western countries competed over selling their products to smaller and less developed countries. However, most countries were unable to develop their own technological capabilities. Innovation remained in the West, and the monopolist model of cross-subsidization was less effective, as the income from international connections was too low. Operators started having difficulties in providing new services and in keeping up with technological changes. From a multilateral perspective, the West did not set up the International Telecommunication Union (ITU) for bargaining or the redistribution of technological capabilities; thus, an asymmetrical settlement for joined services for the benefit of less-developed countries remained a voluntary matter. The ITU was neither legitimate nor the right forum in which to raise political questions and questions concerning technology redistribution that strengthened the autonomy and capacity of the Global South. Issues related to preferential access or exemption from bidding obligations were off the table. The ITU budget, which was controlled by the West, was not provided with sufficient financing and budgets for finance technical training and resource transfer programs for the purpose of capacity building were simply rejected. The West defended a "first-come, first-serve allocation" over a planned system guaranteeing a more equal access to radio-spectrum and satellite-orbital slots, which ensured an area of confrontation since the original deployment and use of that specific technology. Another dependency was habituated and maintained through the financial settlement for joined services based upon an equal split system. Moreover, an asymmetrical settlement for joined services for the benefit of less-developed countries remained a voluntary matter. In addition to those tangible forces, the Western powers also rested on maintaining a non-tangible influence, comprising the "control of knowledge, information, and the policy discourse in which problems were defined and tackled" [13: 150].

According to the perspective of less-developed countries, a lack of proactive movement in the direction of establishing a more equitable system appeared surprising even though "less developed countries were not happy with northern domination of the equipment industry and accompanying standards process, or with the relative conditions of their own networks and services" [13: 139]. Although the ITU voting system provided some leverage, interactions featured not only a lack of power but also a lack of interest in influencing the agenda and participating in technical discussions. The latest issues of standardization and regulation concerning increasingly complex telecommunication systems appeared much less relevant than the immediate development concerns of countries constituting the Global South. In 1984, two-thirds of

the global population had no local access to basic telephony. Today's Internet divide (which keeps an estimated 49% of the world population offline) is analogous to that previous telephony divide, which highlights an enduring inequality and asymmetric distribution of technology. However, one of ITU's three divisions today is the ITU Development Sector (ITU-D), which was created in 1992 specifically to deal with capacity development and digital inclusion.

With the rise of the internet, the U.S. and Western Europe also remained in control of the policy discourse and technology standards. With the creation of ICANN in 1998, the U.S. reproduced its pattern of domination and control, and prevented Internet governance from becoming a part of the ITU. ICANN was initially a "friendly manifestation" of US hegemony, which became conducive to the global adoption of the Internet. It helped to rearrange the pre-existing balance of power between state and the private sector and create new international markets for US technology companies. It was only in 2016 that the contract between ICANN and the US government came to an end.

2.2 China's Rise as Leader in Mobile Communications

The exception in this struggle against Western technology domination was China. Like other less developed or late emerging economies, China's telecommunications network was lagging behind those of Western nations. In 1978, China operated merely 1.93 million telephones. Thus, as part of the reform and opening-up agenda in 1978, the Chinese government started viewing telecommunications as a critical infrastructure for economic development and competitiveness. To catch up with the West and narrow the technology gap between China and the West, the government pursued three development paths. First, in the early 1980s the government initiated a national initiative to boost domestic R&D. The purpose of the government-led program was to track global trends and carry out research in areas useful for China; train China's new generation of students, scientists, and engineers and generate up-to-date industry and scientific knowledge; and offer R&D funds for the state-owned and expanding private enterprise sector. These R&D objectives were part of a larger plan to support the development of China's national defense system. China's national R&D program resembled the Strategic Defense Program (SDI) in the United States, Eureka in Western Europe, or the Human Frontier program in Japan [24].

Second, China started importing Western technologies using loans from the World Bank or Asian Development Bank. The import of the latest Western technologies gained momentum in 1986, when the State Council approved lower import tariffs. Importing Western technology was a clear break with the previous socialist doctrine of self-reliance [25]. However, to prevent foreign-dependency and build local capacity, China followed the "policy of import, digestion, absorption and creation" [26: 25]. The Western companies selling their products to China were required to transfer their technologies to state-owned companies (SOEs). Western

companies were required to form joint ventures (JV) with local firms, as practiced in other industries, and to set up their production and assembly lines in China [24].

The JV approach was necessary to upgrade China's outdated production facilities. The potentially huge telecommunications market provided bargaining power for the Chinese government, so Western companies mostly complied. While Siemens and its rival Alcatel were the first transnational corporations (TNCs) in China, companies like Cisco, NEC, Lucent, Nortel and Ericsson soon followed suit as they feared losing Chinese market entry opportunity. As a result of the JV-driven foreign direct investment approach, imports decreased, local manufacturing outputs increased, and Western companies retained their high market share for some time.

The third critical path of China's catching-up was the government's gradual introduction of a market for local equipment manufacturers [25]. The challenge was the recurring technology gap that emerged with each generational advancement. Domestic competition between equipment manufacturers intended to accelerate the catch-up process and narrow the gap with each technology upgrade. The government actively encouraged the establishment of local companies by supporting independent innovation and eventually fostering their internationalization. A group of three enterprises emerged in the mid-end 1980s, including ZTE (1985), Julong (1989), and Huawei (1987). Datang was another company that was established in 1998. While the former two and Datang were state-owned enterprises (SOEs), Huawei was the only private company. Those four local companies fiercely competed against each other and against foreign companies. While the SOEs could rely on government support and state loans, Huawei faced a continuous uphill battle as it largely lacked government support.

The introduction of competition without gradual reductions of government support paid off. The Chinese manufacturers built cheaper yet reliable alternatives and shortened the catch-up cycles between each new generation of communications technology. Consequently, In 1996, the import policy from 1986 was ended [25] and towards the end of the 1990s foreign companies were increasingly pushed out of the market with many JVs ending in divorce [26]. While core network components were no longer imported, unavailable technology continued to be licensed from Western companies like Qualcomm's CDMA technology or Cisco's data switches and routers. With technology adoption and spillovers predominantly under the control of the Western multinationals, Chinese equipment manufacturers were accused of imitating or reverse engineering Western production and assembly lines [24] or even intellectual property (IP) theft [25, 27]. In any case, the success of catching up is attributed to the combination of China's three development approaches—national R&D program, import and joint ventures, domestic competition—all of which led to the technology capacity and capability necessary to ensure the establishment of a fast-growing domestic telecommunications and ICT industry.

The introduction of market competition proved to be a key determinant of China's success [25]. Unlike the other two SOEs, ZTE was state-owned but privately managed and therefore, avoided complex accountability under different ministries [25: 325]. Among other factors, ZTE's success could be largely attributed to this aspect of enhanced self-management and thus the ability to respond more quickly to

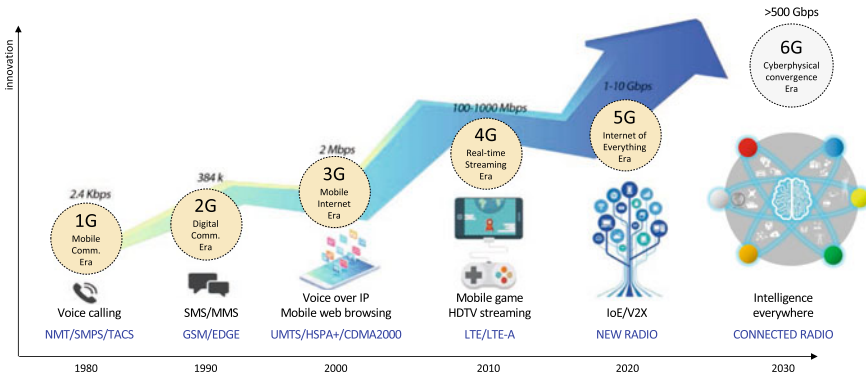


Fig. 2.1 Evolution of mobile communication systems from 1 to 6G. *Note* Modified from *5G and beyond: fundamentals and standards* (p. 3) by X. Lin and N. Lin (Eds.), 2021, Springer Nature

market demands. This also explains why Huawei, the only privately-owned company amongst the four domestic competitors, came out as the winner in domestic competition. Around 2005, Julong was driven out of the market, however, Datang has remained an active local player. Despite its domestic and international success, ZTE increasingly lagged behind Huawei during the 2000s. During the introduction of the next generations of mobile communications technology, including 3G (2000), 4G (2010), and 5G (since 2020), Huawei became the global industry leader in terms of global market share, technology standards-setting, as well as declared 5G and ICT patent families [28–30]. Huawei remains ahead of its main competitors, including Samsung (Korea), ZTE (China), LG (Korea), Nokia (Finland), Ericsson (Sweden), or Qualcomm (United States), and owns 40% of all 6G patents worldwide as of September 2021 [20]. Figure 2.1 highlights the overall evolution of the communications systems [31: 3].

Overall, the rise of China's telecommunication industry was extremely successful. In 1978, only 0.38% of China's households had a telephone, which meant that China lagged behind the United States by 75 years [32]. In 2004, China started ranking first globally in the total number of both mobile phone (270 million) and fixed line (260 million) users [25, 33], and, in 2008, in total Internet users (253 million) [34]. In October 2021, about 1.64 billion mobile phone subscriptions were registered in China [35], and the number of Internet users had surpassed 1 billion as of June 2021 [36], thereby further reducing its digital divide. China's successful development approach has confirmed Rodrik's observation that market forces alone are insufficient to achieve structural change. The government played an important role in setting up the domestic playing field, formed the industry actors and defined the rules of the game. In 2019, however, Huawei and other Chinese high-technology companies were severely hit by unilateral sanctions imposed by the United States, which had the effect of damaging not just Huawei's but China's development in general, reinforcing China's strategy towards technological self-reliance and the rivalry between the largest and second-largest economy in the world.

Chapter 3

Technology Silos of Today or the End of Global Innovation



The global innovation and value ecosystem was an important outcome of the liberalist transformation. Policymakers, however, were unable to anticipate that market liberalization, the rise of the Internet, and advancements in mobile communications would have such a tremendous impact on innovation, growth, and development. Those factors radically changed the old telecommunications industry and propelled mobile communications technology to become the fastest adopted technology of all time, driving the establishment of a trillion-dollar market and having a ripple effect across major industries. It was also unexpected that past transformations would turn data into a strategic economic factor and that the 5th generation of mobile communications technology would become the enabler of the world's emerging digital economy and society.

However, the liberalist transformation and the rise of a global innovation and value ecosystem was to be short-lived. In the aftermath of the 2008 Global Financial Crisis (GFC), the global political, economic, and technological landscape experienced a sharp return to "territorial sovereignty" [15], and especially in the United States, the European Union and the People's Republic of China. The return of territorial sovereignty is both a response to and signal of today's crisis in multilateralism and multistakeholderism. It signals the crisis in global governance and, as Thomas Piketty [in 37] puts it, "a growing inability to achieve any coherent understanding of global change as a basis for defining common interests and formulating large-scale strategies." After the deregulation of the 1980s and 1990s, this return of sovereignty can be regarded as the great re-regulation and strategic realignment of the times. Governments claim back the power from the private sector delivering on Internet technology based on autonomy constraining policies as well as industrial policies, but without re-establishing new state monopolies. It's mainly done based on regulations, restrictions, and sanctions. This development bears the risk of undoing what has enabled unparalleled innovation and development in the past and may be regarded as tantamount to throwing the baby out with the bathwater.

Different terminologies and concepts for the emerging emphasis on sovereignty are now in common usage. In China, it is referred to as "Digital China," or "Dual

Circulation” as highlighted in the 14th Five-Year Plan, in America as “Build Back Better” (and the various other US technology, competition, and security-related policies [cf. 38], including the National Defense Authorization Act of 2021, Democracy America Competes Act, Strategic Competition Act of 2021, Innovation and Competition Act of 2021, Technology Partnership Act, and Holding Foreign Companies Accountable Act) and in Europe as “Green Deal and Fit for the Digital Age.” The problem is not sovereignty or the independent regulation of national affairs. As Dani Rodrik [22: 55] asserts, “a healthy world economy needs to rest on healthy national economies and societies.” However, the problem is the fine line that separates sovereignty from nationalism and protectionism or the regression towards ideological and technological silos, manifesting in the continuing great power rivalry between the US and China. The demand for sovereignty has not led to a re-emergence of twentieth century-type state monopolies, but to the protection of digital and technology markets and the sanctioning of foreign businesses justified by national security concerns, combatting fierce competition and values-driven foreign policies.

The period of hyper-globalization or hyper-capitalism between the 1980s and 2008 was marked by an era of rising multilateralism and multistakeholderism. Regarding the former, national governments saw the need to participate in global coordination and problem solving. The limits of market fundamentalism and the recurring shocks and sharp distributional implications of the previous hyper-globalization phase, including the issue of climate change, had made national sovereignty and the independent regulation of national affairs appear less significant or impactful. Governments could not cushion the impact of disruptions inflicted by global markets and global supply chains with more democratic or socially just domestic policies. Instead, they resorted to more liberal policies. At the same time, with the rise of China and the Global South over the past four decades, the U.S., and the West in general subsequently lost its previous dominance and control over multilateral institutions, including those of the United Nations. The voting and collective bargaining systems strengthened the position of the Global South and China within those multilateral institutions. While it has benefited from the Western multilateral order, China has sought to defend its own interests and increase its control over the multilateral institutions by creating and or promoting institutions such as the Regional Comprehensive Economic Partnership (RCEP), the Asian Infrastructure Investment Bank (AIIB), or the Shanghai Cooperation Organization (SCO).

Highlighted in the following section is the notion that China’s reaction should not come as a surprise given the decades of U.S. domination and coercion of the global telecommunications and Internet industry. In response, the U.S. has sabotaged the multilateral order it created in the post WWII era. Accordingly, it sanctioned the dispute settlement mechanism of the WTO, accused the World Health Organization (WHO) and the ITU of allowing Chinese interests to increasingly influence them and other parts of the United Nations [15]. The WTO’s policy recommendations are rarely adopted by national governments; thus, the fight against the global Covid-19 pandemic has been a governance failure on national and international levels and revealed the unequal access towards health. Moreover, China has proposed to

the ITU a “New IP” standard anchoring cyber sovereignty on a fundamental technical level, which when implemented counters the US control over the Internet and ICANN. While ICANN remains a Western-world dominated multistakeholder organization and the US government is no longer contractually related to it, China is still excluded from its board. Whereas a private organization might be more efficient in administrating the Internet, ICANN should be part of ITU. Both institutions have become ongoing proxies for a global diplomatic dispute over who is going to control cyberspace.

Overall, the disruptions of hyper-globalization and the US-China power rivalry are primary causes of today’s crisis in global governance. Brexit and a politically fragmented European Union have further added to the crisis. Ultimately, Russia’s war against the Ukraine, which started in February 2022, and its violation of international laws and human rights has, for now, irrevocably damaged America’s post World War II global order. Russia risks becoming a pariah state for the West and a liability for China given its “no-limits” partnership with Russia. Developments such as the Ukraine crisis only perpetuate the demand for territorial sovereignty based on national security concerns.

3.1 The Rise of Digital Sovereignty in the West

An essential corollary to the re-emergence of territorial sovereignty is the strategic focus on *digital sovereignty* [15]. With digitalization as the main driver of growth and development, digital sovereignty is at the core of the return of territorial sovereignty and ought not be viewed independently. The goal of digital sovereignty is to bring back national monopolies, but to prevent a new straitjacket of historical proportions, this time not of hyper-globalization, but of hyper-digitalization. Two major developments facilitate the shift toward digital sovereignty: First, by the unsustainable limits that led to an end of the liberal transformation and crises in global governance; second, and more specifically, by the sober assessment that the Internet has not been an intrinsic force for good or a natural conduit for liberal democratization as many in the past had believed [39, 40]. The sober assessment includes concerns regarding cybersecurity and privacy protection as well as strategic considerations related to technology competition and the demands for increased national and regional security and autonomy [cf. 41].

Escaping the previous straitjacket of globalization was about regaining national control over deregulated financial markets and global supply chains dominated by multinational corporations. Digital sovereignty, meanwhile, demands retaining or regaining control over data and digital technologies, which is central to the digital transformation and the looming paradigm shift and is discussed below. Due to the increasingly ubiquitous nature of digitalization and the virtualization of all domains in the physical world, what digital sovereignty ultimately seeks to control is much broader in scope than the policy goals during the height of globalization and past deregulation activities. Digital sovereignty addresses the impact of digitalization, not

only on markets, but on the entire economy, society, public sector, foreign relations, and security and defense.

Over the course of the past decade and despite clear differences, digital sovereignty has subsequently developed into integrated, comprehensive policy approaches in Europe, China, and the United States. There are also demands for digital sovereignty in the Global South to reduce or avoid technology and data dependencies, while the lack of digital infrastructure and access to internet remain a chronic issue [42]. A new generation of scholars highlight that post-colonial dependencies risk merely being replaced by the rise of “data colonialism” and “AI colonialism”, “re-entrenching racial hierarchies and fueling a digital apartheid” [43]. Not just the West, but also China is seen as a hegemonic digital force in the Global South. What initially triggered the rise of digital sovereignty in the West is a series of severe and increasingly more sophisticated cyber-attacks as well as coercive market practices and privacy-infringing business models of big technology companies, which are critically associated with the rise of “attention” and “surveillance capitalism” [44]. For Yanis Varoufakis, capitalism has been toppled by “techno-feudalism,” which is an economic mode where financial markets are fully decoupled from the real economy and “digital platforms have replaced markets as the locus of private wealth extraction” [45]. The anti-market forces of capitalism have created digital monopolies and oligopolies, which include companies like Google (Alphabet), Apple, Facebook (Meta), Amazon, and Microsoft. Not only during the 2000s and 2010s, but the supposedly liberal 1990s. Thus, the early days of the World Wide Web saw a dramatic episode of monopoly formation in the absence of a government mandate to establish monopolies. One is reminded of Microsoft’s constant anti-trust battles, abuse of its vast consumer networks and locking out competition. China has experienced a similar market concentration and unfair practices caused by its BAT companies (Baidu, Alibaba, Tencent), and other fast-growth and innovative technology firms in the digital economy, including DiDi, Meituan and Ant Group [46]. The once celebrated big technology companies increasingly face legal opposition as Governments seek to limit and reduce their power over markets, information and communication.

Reflecting upon the initial expectations of the Internet’s potential, it did not become a readily democratizing force, but manifested as an open and free cyberspace with enhanced advocacy and transparency, which toppled unaccountable hierarchies and realized a Habermasian “communicative rationality” [47]. These facts have resulted in the sober assessment, which has only recently entered the mainstream public discourse [48], that digitalization could be identified as the cause of increasingly severe cyber-physical and privacy threats and risks attended by longer-term structural imbalances. As Neyer [15: 13, 5] puts it, echoing Varoufakis’ words: “The optimism of the 1990s and the 2000s ignored the shaky pillars on which global governance rests. Most of the literature of the time understood technology and technological innovation as a force for good only.” The Internet has become a synonym “for the global market dominance of large US mega-corporations, of massive tax evasion by platform corporations and of intensifying surveillance and control by private and public US institutions.” Based on Edward Snowden’s revelations in 2013, the demand for digital sovereignty was already triggered by the U.S. mass

surveillance, that allegedly started at the beginning of the 2000s, was run by the US National Security Agency (NSA) and the Five Eyes Intelligence Alliance. However, such developments should not come as surprise. In the century prior to the advent of the Internet many prominent thinkers had been occupied identifying, assessing and avoiding the dangers of technocracy. Most notably, amongst those who ended their philosophical journey in despair, was Martin Heidegger [cf. e.g., 49, 50].

The demand for digital sovereignty has been significantly impacted by fierce competition between the major economic blocs over technology leadership, conventional trade disputes and geopolitical rivalry. Consequently, digital sovereignty has led to a greater emphasis on government control over the content and processes of digital information and communication, and on fair competition in the digital marketplace. It also led to the demand for autonomous technology choices and deployment of strategic digital capacities and resilient infrastructure, including fiber-optics and mobile networks, complemented by secure supply chains. The demand for government control has signaled a shift from an ex-post to an ex-ante or risk-based governance approach that explicitly prescribes what digital actors should do and describes what governments should prevent or mitigate. The codification of digital sovereignty in regional and national law is accompanied by a renaissance of industrial policy-seeking to boost innovation and competitiveness. These developments can be observed in all three major economic blocs and manifest not only in terms of cybersecurity and privacy regulations, but also in terms of trade restrictions, foreign investment screening mechanisms, as well as international procurement and anti-coercion instruments.

The geopolitical rivalry and trade tensions between the West and China have strongly politicized the demand for digital sovereignty crossing the lines of protectionism and nationalism. However, the divide is not only between the West and China, but also between the United States and the European Union. The EU seeks to become the world's safest and most secure digital market and a global digital-norms builder and has developed the world's most comprehensive legislative landscape, highlighted in Figs. 3.1 and 3.2. Meanwhile, the US has condemned Europe's digital sovereignty strategy as protectionist and discriminatory for US technology firms. This includes regulations and laws, such as the proposed Digital Services Act (DSA) and Digital Markets Act (DMA); Data Governance Act (DGA), Data Act, and ePrivacy Regulation. Although such regulatory landscapes aim at mitigating the risk of "technology feudalism" and the monopolizing forces of big technology companies, doubt has been cast on the effectiveness of the US-EU Trade and Technology Council (TTC), which was supposed to improve the collaboration between the EU and US on trade and technology issues in the post-Trump era. Other important legislation, less targeted on US firms, which seeks to increase cybersecurity and data privacy are the EU's Network and Information Systems (NIS) Directive, General Data Protection Regulation (GDPR) and the proposed Artificial Intelligence Act.

The invalidation of the EU-US Privacy Shield by the EU Court of Justice, i.e., the EU-US data transfer agreement, which had already replaced the old Safe Harbor

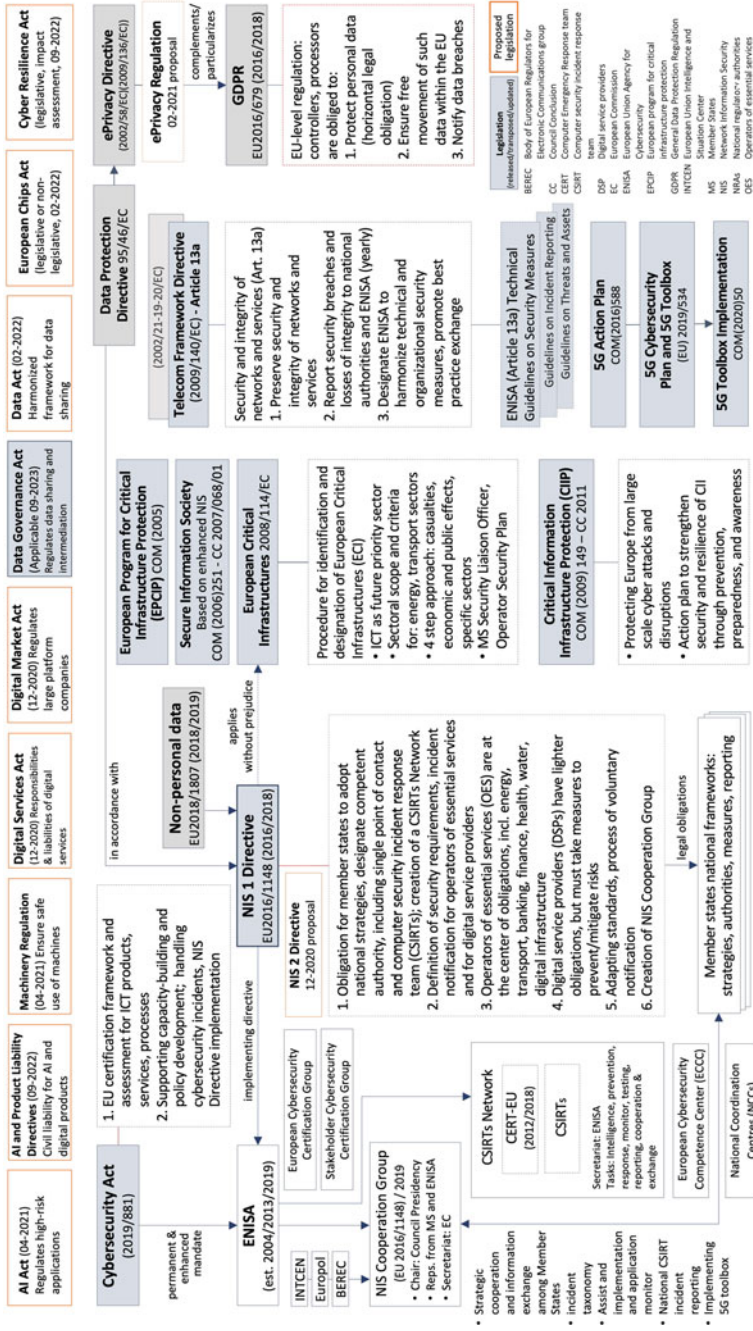


Fig. 3.1 Cybersecurity and data privacy legislations in the European Union. *Note* Based on author's own research

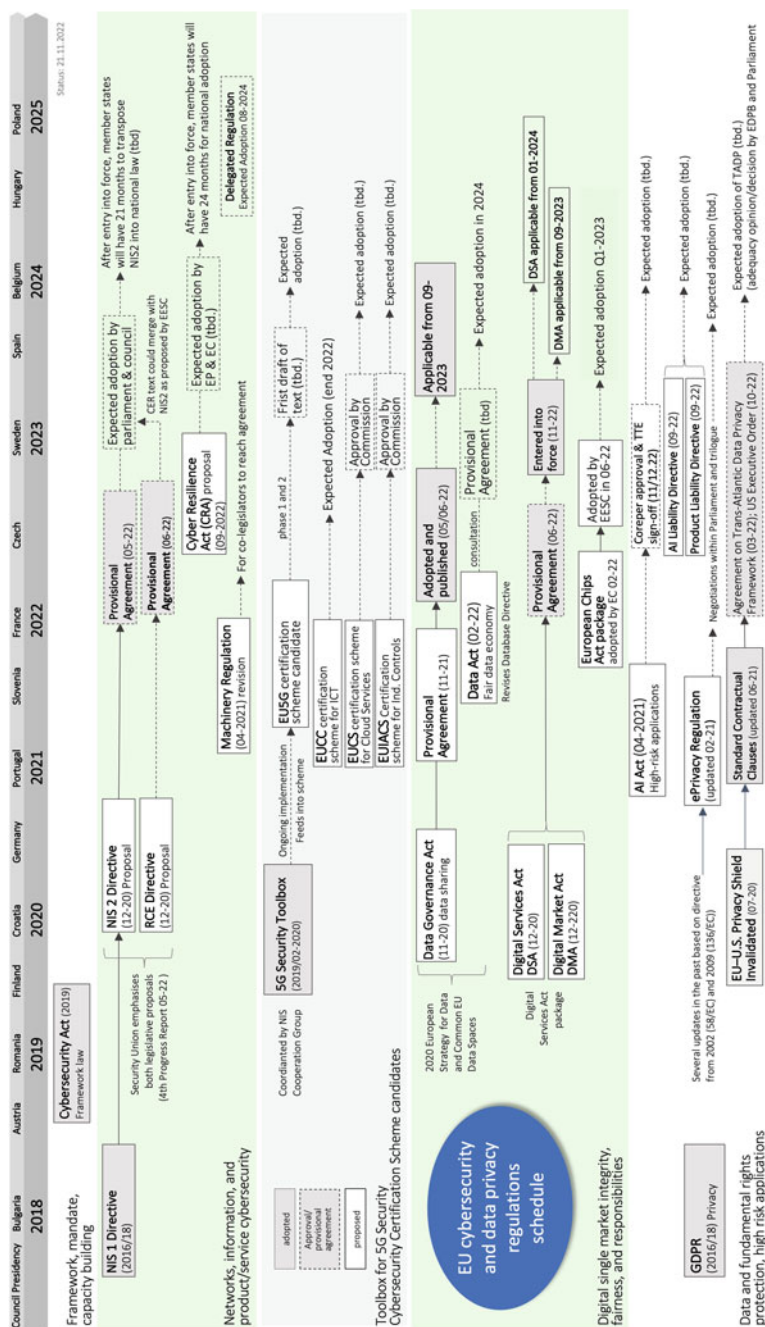


Fig. 3.2 Timeline of major EU cybersecurity and data privacy legislations. *Note* Based on author's own research

Privacy Principles has caused significant friction and highlighted Europe's determination to implement its digital strategy. The EU Court of Justice ruling and the adoption of the GDPR have complicated the transfer of person-related data from the EU to the US. This may have a ripple effect for third countries, like China, due to violations of the fundamental rights and privacy protection laws of the EU. Regarding China, the European Commission perceives the processing and storage of data in China to be an even greater challenge to EU laws than the contested US surveillance and data localization laws, because China's cybersecurity and privacy laws don't "provide equivalent level protection to the data subjects in the EU" [51: 24]. However, for the EU, data transfer with China and China's data champions are less of an immediate issue than the import of Chinese hardware equipment for next-generation mobile communications and other technologies that are labeled "dual-use".

3.2 China's Pursuit of Cyber Sovereignty

China started its pursuit of "cyber sovereignty" (*wangluo zhuquan*, 网络主权) by initially controlling Internet use in the late 1990s and the implementation of its national firewall (the "Golden Shield" project) in the early 2000s. While the policy term "cyber sovereignty" only became widely used from 2010 onwards [52], the purpose was not only to block and censor both Western and domestic content and digital services considered harmful to national security and social stability, but also as a protective measure against U.S. cyber espionage and coercion, which had started from the beginning of the 2000s. Since the Internet and digitalization have manifested as a strategic force of economic growth and competitiveness with a rapidly expanding surface of cybersecurity attacks and data privacy violations, China started implementing a comprehensive landscape of cybersecurity and privacy protection laws (see Fig. 3.3).

Equivalent to the EU's Network and Information Security (NIS) directive and General Data Protection Regulation (GDPR) of 2016—two landmark legislations aimed at protecting the security of network and information systems as well as the privacy of personal data (see Fig. 3.3)—China's Cybersecurity Law (CSL) of 2017, Multi-Level Protection Scheme (MLPS) of 2019, Critical Information Infrastructure Security Protection Regulations of 2021, and Personal Information Protection Law (PIPL) of 2021 serve a similar purpose [cf., e.g., 51, 53, 54]. Based on an integrated legislative framework, the government's intention is to safeguard China's digital economy and increase assurance and trust within society and business, which is deemed necessary for China's digital economy to develop and prosper. During the period of the 14th Five-Year Plan, the government's objective was to grow the digital economy so that it would account for 10% of China's GDP by 2025 [55]. The focus on cybersecurity was complemented by the CPC Central Committee's strategy of implementing a "regulated, healthy, and sustainable development of the platform economy." The latter is comparable to EU's transformation of its economy into a digital single market (DSM) as well as its Digital Services Act (DSA) and Digital

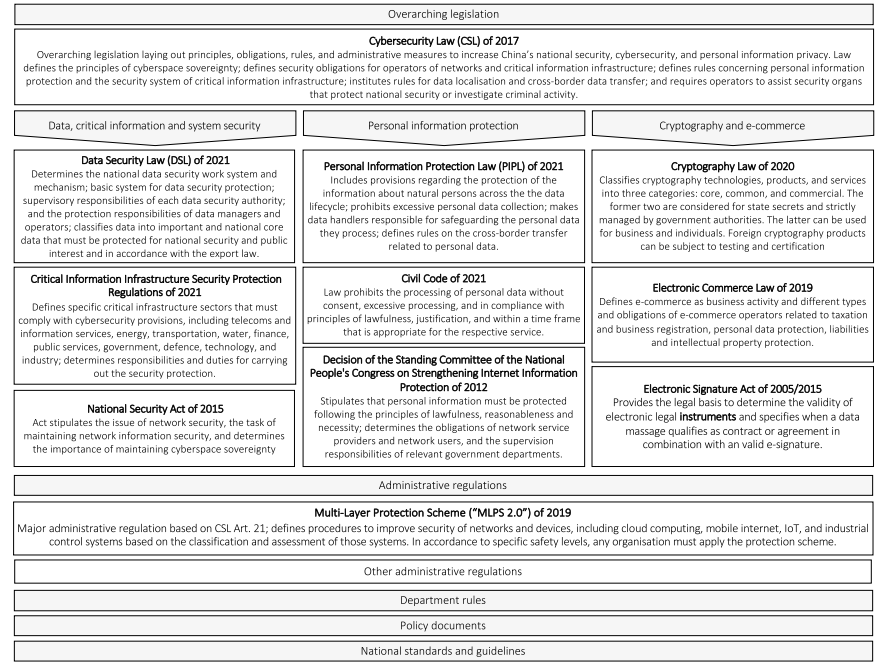


Fig. 3.3 China’s evolving framework of cybersecurity laws. *Note* Based on author’s own research

Markets Act (DMA) proposals, which both seek to regulate and restrict large digital platforms and the rise of “techno-feudalism” (see Fig. 3.1).

Another key pillar of China’s overarching Cybersecurity Law (CSL) is to “safeguard cyberspace sovereignty and national security.” It institutes rules for data localization and cross-border data transfer. In accordance with CSL, the Personal Information Protection Law (PIPL) further specifies those rules and basically restricts the cross-border transfer of data related to Chinese citizens. Moreover, the Data Security Law further classifies data into “important data” and “national core data,” which must both be protected, not only for national security and public interest, but also in accordance with data of controlled goods that are prohibited or restricted from export. In other words, important and national core data must generally remain within China. The Data Security Law (Article 26) also specifies the implementation of countermeasures against other countries that discriminate against China’s data and technology economy [56]:

Where any country or region adopts discriminatory prohibitions, restrictions, or other similar measures against the People’s Republic of China in respect of investment, trade or any other field related to data and data development and utilization technologies, the People’s Republic of China may take countermeasures against that country or region in light of the actual circumstances.

While China's cybersecurity and privacy laws emphasize cyber sovereignty and national security as means to improve trust and a functioning digital economy, they are also clearly intended to protect China's digital market. Unlike China's telecommunications industry, which was initially open to Western businesses before China's national champions gained majority market shares, China's Internet was never fully open and none of the US' big technology companies have succeeded in China, especially within the area of information and transaction platforms. The reason of such differentiated "catch-up protectionism" seems obvious: building internet platforms for ecommerce and social media is not as difficult as building the underlying telecommunications infrastructure and hardware. The former is also more sensitive for the government in terms of ensuring societal and political control. Thus, from the outset China promoted its own big technology and digital platform companies like Baidu, Alibaba, and Tencent (BAT). A more comprehensive push towards digital sovereignty and self-reliance across key technology areas is reflected in the Chinese government's strategic policy plans, including "Made in China 2025", and "China Standards 2035" as well as in the "Dual Circulation" strategy specified in the 14th Five-Year Plan (2021–2025).

Similarly to the European Union, China has developed a comprehensive regulatory framework for cybersecurity and privacy protection. Despite using similar terms and adopting comparable legislations, however, the meaning of digital sovereignty is clearly influenced by the differences in values, political systems, histories, and stages of economic development. This has caused divergent views regarding the concept of digital sovereignty, mainly in terms of the relationship between state and citizen and foreign interference. All three major economic blocs—the US, Europe and China—take a risk-based approach, which excludes those who do not share the same definitions about privacy, cybersecurity, fair competition, and fundamental rights. The West perceives China's cyber sovereignty as a gross violation of democratic values, laws, and human rights. China's mass digital surveillance and the government's unrestricted access to data violates the West's and especially Europe's legal tradition (for further discussion, see Sect. 5.1). Opposing the Western critique, the Chinese government argues that the path towards universal rights is not commonality but particularity and follows China's idiosyncratic approach, which is mainly informed by its history, culture, and political system. Despite differences, all three regions protect their respective economies based on data localization, cybersecurity and privacy laws as well as other related regulations.

3.3 America's Whole-of-Government Approach

As indicated above, the mobile communications industry has become one of the primary targets of territorial and digital sovereignty, epitomizing the fierce competition over technology leadership as well as the crisis in multilateralism and global power rivalry. Once increasingly relegated in the West—and especially in the US—as a commodity and low-margin industry, mobile communications networks are now

regarded as key enabler for the digital transformation, as critical infrastructure and therefore a matter of national security. Previous research and development (R&D), which led to the third (3G), fourth (4G), and fifth generation (5G) of mobile networks (see Fig. 2.1), strongly benefitted from the open value and innovation ecosystem that emerged after the deregulation of the telecommunications sector. This is no longer the case following the rollout of 5G networks and the R&D work leading to the sixth generation (6G).

Since the Trump administration introduction of the Secure Equipment Act of 2021, continued under the Biden administration, the United States began banning 5G network equipment from Chinese suppliers and kept pushing the European Union, its members, and other leading economies to exclude and remove Huawei and ZTE equipment from their mobile network infrastructure. This ban is complemented by the U.S. government's unilateral trade restrictions on China's semiconductor makers and importers to sabotage and contain China's development in this and other key technology areas. These coercive and protectionist measures, which are perceived by the Chinese government as having been illegitimately justified on the grounds of national and economic security, apply to the deployment of 5G networks, semiconductors, software, and other advanced technologies. These measures are aligned under the Biden administration's whole-of-government approach, which seeks both to strengthen US digital and technology competitiveness and to restrict and contain the development of China and other adversaries. Figure 3.4 lists the main policy reports and acts that comprise the containment strategy of the US. There is also the policy proposal to ban any application that would use China's digital yuan as virtual currency.

3.4 Between Outright Ban of 5G and Raising Security Standards in Europe

Despite ongoing pressure by the US government, the EU has resisted an outright ban of Chinese technology companies and appears less aggressive towards China. However, the European Commission has introduced a series of cybersecurity regulations that clearly target Chinese technology companies. In particular, the European Commission implemented the Cybersecurity Act and a directive on the security of Network and Information Systems (NIS Directive), which restricts individual companies, deemed essential or important to address cybersecurity risks (see Fig. 3.1) from using Chinese equipment. Unlike the privacy protection and digital single market (DSM) related regulations, the cybersecurity regulations are not targeted at protecting the data of individual citizens and ensuing the functioning of digital single market, but the security of critical infrastructure (or that of essential or important entities), including energy, transport, banking, finance, health, water, digital infrastructure. The EU has also introduced the 5G toolbox to ensure secure the 5G networks that are the core infrastructure for Europe's digital transformation. While cybersecurity

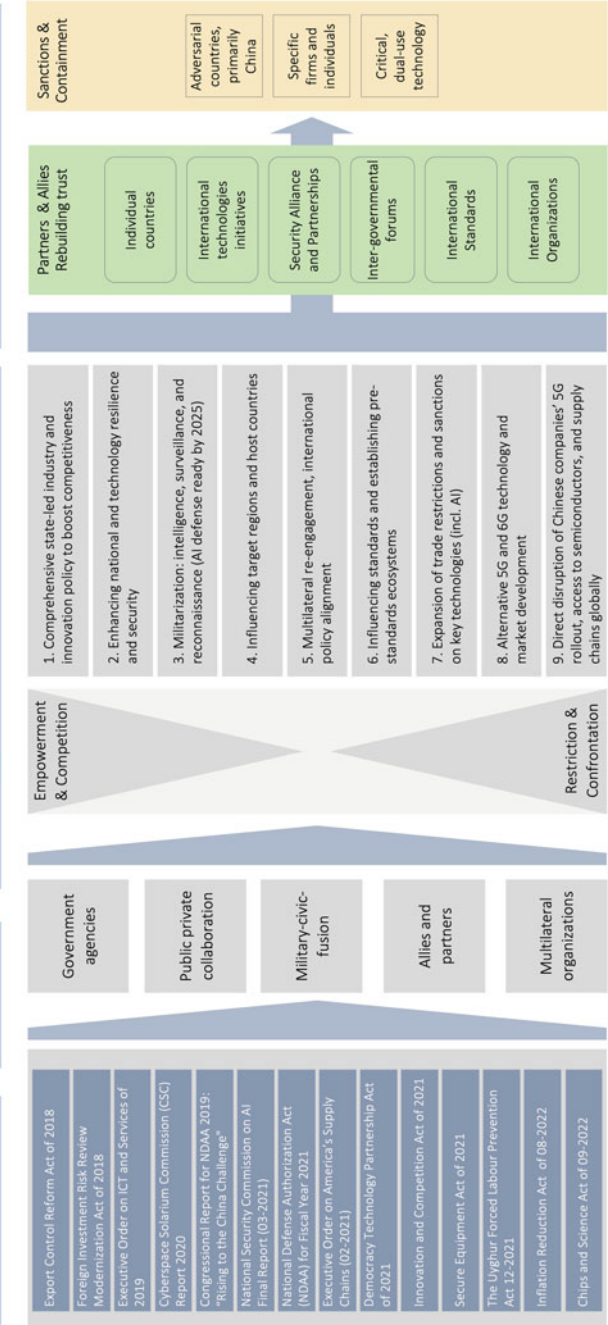


Fig. 3.4 United States' whole-of-government approach towards technology leadership. *Note* Based on author's own research

is essential for mitigating the rapidly changing and intensifying landscape of cybersecurity threats (see Fig. 4.1) and for building trust and confidence in the digital economy, the EU clearly aims at minimizing its exposure to “high-risk suppliers” and “avoiding dependency” on these suppliers at national and EU levels.

The EU does not directly ban Chinese firms but provides the legal basis for a ban of 5G telecommunications equipment to be established on EU member state level. Although no evidence has been provided about security breaches linked to Chinese network equipment in the past, the Scandinavian, Eastern European countries and the United Kingdom, have taken the strongest position, effectively banning Chinese telecommunications equipment from their 5G networks. As 5G network infrastructure is built upon that of 4G, such a ban often requires the dismantling of 4G infrastructure as well. In addition to those hardliners, the government authorities of France and Italy haven’t banned Chinese suppliers and are legally equipped to sanction the acquisition of Chinese equipment based on national security concerns. Other European countries have not yet passed any new laws but announced they will not use Chinese equipment in their 5G roll outs. In Germany, several ministries must agree to ban Chinese suppliers, which is less likely to happen. Yet, the possibility of restriction has increased with the adoption of the country’s IT Security Act 2.0. In addition to those cybersecurity and 5G security legislations and regulations, the European Commission is also preparing the Due Diligence Act and thus a mechanism that would require companies to conduct supply chain due diligences about breaches of human rights and environmental standards. Although not explicitly mentioned, the EU seeks to primarily target and sanction China and its technology companies. As most cyberattacks are carried out by crime groups or individual criminals (for an overview, see Fig. 4.1) that do not possess or sell any telecommunications equipment, and as operators control data flows and are primarily responsible for cybersecurity, the exclusion of Chinese technology is primarily geopolitically motivated. So far, evidence for a secret “kill-switch,” which could be used by the Chinese government to shut down digital infrastructure and thus disrupt the continuation of critical infrastructure in the West, has not been found.

Managing cybersecurity risks has become more complex in the 5G environment. Global supply chains for network equipment, increasing connectivity, and widespread adaptation of AI (see Fig. 4.1) increase the surface for cyberattacks. Bans based on the nationality of the equipment provider offer little assurance for cybersecurity and national security. However, Western dependency on Chinese technology could also become an issue of securing equipment supply and maintenance of digital infrastructure, which could be denied by the Chinese government at times of raising geopolitical tension, disrupting the continuation of critical infrastructure and national security. Also, the issue of backdoors used to infiltrate networks secretly remains unresolved. It is unlikely that backdoors and “bug doors” can be detected within the vast amount of software code needed to run mobile networks and an exponentially rising number of connected things. In the past, the US National Security Agency (NSA) made use of or exploited backdoors and vulnerabilities: “an NSA division called ANT has burrowed its way into nearly all the security architecture made by the major players in the industry—including American global market leader

Cisco and its Chinese competitor Huawei, but also producers of mass-market goods such as US computer-maker Dell” [57]. ANT continues to be detected in US technologies [58]. There are also allegations that mass and more sophisticated digital surveillance carried out by US intelligence agencies did not decrease but increase since the Snowden revelations [59].

Nevertheless, the push towards technological decoupling is also a result of fierce competition and because China has become a global leader in 5G technology development. The past focus on software and services, which usually offers higher profit margins, while disregarding telecommunications equipment as a low-margin commodity and not as strategic infrastructure was, in hindsight, a strategic mistake. While Europe still has companies like Ericsson and Nokia, the US lacks a telecommunications equipment provider. As a consequence, the West’s reliance on Chinese technologies has become perceived as a matter of strategic national and economic security.

3.5 Hard Decoupling of 6G Innovation

While the R&D work for 5G still benefits from the global innovation ecosystem that had emerged from the deregulation of the telecommunications industry, the early-stage R&D work related to 6G is already impacted by ruptures in the global innovation ecosystem. There is currently no collaboration between Western and Chinese leading technology companies and research institutions. In the race to 6G, the US, EU, South Korea, Japan and China run their own respective state-backed R&D and industrial political projects. In particular, the Next G Alliance, which is a trade group that manages 6G development in North America, has drawn on European telecommunication firms Ericsson, Nokia, South Korea’s Samsung and LG, Japan’s Sharpe, NEC, DoCoMo, Taiwan’s TSMC and others to establish US leadership in the 6G era. The Next G Alliance explicitly states that organizations that are listed on the United States Department of Commerce entity list, which includes leading Chinese technology companies, are not eligible to join the alliance; thus, forming a small circle of “like-minded” countries and 6G R&D stakeholders. In addition to the EU’s digital transformation strategy, which includes “Shaping Europe’s digital future,” “European industrial strategy,” “2030 digital compass and digital decade targets for 2030,” the EU has launched its own 6G R&D program. Nokia is leading a 6G flagship project, Hexa-X, with a total investment of 80 billion euros, to build a 6G technology and research roadmap for the EU. China clearly risks being marginalized in 6G R&D and standards. Impacted by the US Department of Commerce sanctions, Chinese high-tech companies, including Huawei and ZTE, are not only excluded from the Next G alliance, but also denied access to technology and research exchange opportunities in the related technology areas, seriously affecting China’s high-frequency wireless technology and provoking China’s self-sufficiency strategy. Despite the general lack of collaboration, in June 2022 Europe’s 6G Smart Networks and Services Industry Association (6G-IA) and China’s IMT-2030 (6G) Promotion Group still signed a

memorandum of understanding (MoU), which encourages the collaboration on the “development of a single global standard to ensure one global ecosystem for 6G” and on “6G research projects” [60]. The former group represents European industry and research for next generation networks and services, the latter is China’s major platform to promote 6G R&D and international cooperation.

A hard decoupling between the West and China risks 6G, which is expected to become the next big game changer around 2030 and overcome the limitations of 5G [61], failing to become the future global technology standard and thus hamper all other industrial developments. In the past, the most successful mobile network generations were those defined by standards that became globally implemented. The fundamental differences between the West and China, which are further addressed below, have caused and intensified the fragmentation of the global cyber regime complex and balkanization of the Internet, and reinforce the crisis in global governance [62].

Chapter 4

The Transformation of Our Time



Telecommunications enables the transition towards a future economy that will be fully digitalized; thus, re-analyzing its history is crucial for understanding today's return of sovereignty, protectionism, and technology nationalism. However, to further grasp today's crisis in global governance requires broadening the scope of inquiry to look at artificial intelligence (AI) and climate change, the two most impactful drivers of the twenty-first century's transformation policy that decision makers must navigate today [63, 64]. Although both issues are different in nature, their level of scope and impact makes it necessary to address them together. AI and climate change are global phenomena that without global collaboration and coordination humanity is unlikely to complete either transformation successfully. As discussed below, both climate change and AI face a seemingly insurmountable governance gap, which undermines the possibility for effective collaboration directed by common goals and principles, and thus, a successful transformation towards responsible AI and a carbon-neutral future. To succeed, the transition to a carbon-free economy needs to be grounded on climate policies that incentivize the reduction and prevention of climate change risks and damages, and an inclusive and trustworthy digital economy that fairly distributes the benefits of AI, while ensuring human control over globally ubiquitous automation. Whereas mobile networks have become the enabling digital infrastructure, AI is an all-purpose application that can determine how mobile networks are utilized for economic, political, societal, as well as strategic and military purposes and efficiency gains. While technology has long been promulgated as a solution to the climate crisis, the potential for intelligent decarbonization has been increasingly attributed to AI. As such, a direct link is suggested between AI and climate change, which is addressed below. However, it remains questionable as to whether technology aids bridging the governance gap. The heightened demand for sovereignty, newly emerging ideological and technological silos and the exiting crisis in global governance portray a dystopian future.

4.1 The Governance of Responsible AI

AI, coupled with the reuse of mass data and ubiquitous digitalization, has become a global driver for competitiveness. Moreover, AI is widely described as having the potential to vastly improve efficiencies across all domains and sectors and help resolve humanity's greatest challenges, including the realization of the United Nations Sustainable Development Goals (SDGs) [65–67]. However, the rapid and widespread diffusion of narrow AI—its efficiency, scalability, performance, and decision automation—as well as the hypothetical advancement towards general AI may hold disproportionate risks and have led to fundamental questions concerning human dignity and existence [44, 68–70]. AI's disparate technologies [71] have been linked to various risk scenarios across applications, sectors, and geographies. Those scenarios can be clustered into two groups based on immediacy and scope of the risk: (a) direct cyber-physical threats and (b) longer-term structural imbalances. As specified below, such a landscape of threats and imbalances makes AI governance an urgent matter of global coordination [63].

4.1.1 *The Changing Nature of Cyberphysical Threats*

The adversarial use of AI technologies can tremendously change and intensify the existing landscape of cybersecurity and threats, which are experienced directly in specific domains and sectors (see Fig. 4.1, cf. [68]). Accordingly, the adversarial use of AI may lead to an expansion of existing threats, more effective and targeted threats, and the emergence of entirely new types of cyberphysical threats. In addition to intended attacks—mainly those causing disruption, theft, or espionage—there will be unintended accidents based on engineering errors and bottlenecks that could have unpredictable consequences and become the target of intentional exploitation. Intelligent automation may also reduce the psychological barrier or increase the psychological distance between attacker and target. Given such a cyberphysical threat scenario, AI security is increasingly seen as a risk domain alongside traditional cybersecurity, which is already a matter of individual privacy protection, as well as corporate and national security.

Cyberphysical incidences are primarily caused by individual criminals, organized crime groups, terrorists, and states or state-sponsored actors, and they mainly involve the disruption of digital and physical systems, theft, and cyber espionage. Cyberwarfare is a combination of all of these and involves information and psychological operations to manipulate public opinion. Due to its scalability and efficiency as well as the increasing psychological distance between the attacker and the target, the malicious use of AI may lead to the expansion of existing cybersecurity threats, create entirely new forms of cyber-physical threats, and attacks and crimes that are more precisely targeted via optimization of the trade-off between effort, harm and

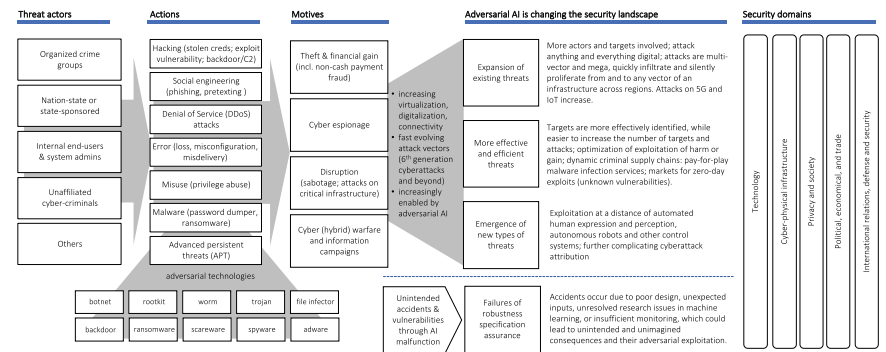


Fig. 4.1 Changing landscape of direct cybersecurity threats. *Note* Based on author’s own research

or gain. Due to the changing landscape of immediate threats and risks, cybersecurity (and more recently AI) has become a matter of national and economic security and military priority. While 5G mobile networks eventually enable the connection of everything with any other thing and with everyone, at home, in the office, in factories, and in smart cities, AI provides a tremendous source of automation for the purpose of efficiency and convenience. The combination of AI and 5G technologies expands the surface for cyberphysical threats and accidents. It also further complicates both the deterrence and attribution of cyber-attacks or other hacking exploits due to the increasing complexity and interconnectedness of computer networks. Total prevention of the new threats is improbable; however, threat mitigation is possible. For many governments, it is not a question of *if*, but *when* severe cybersecurity incidences will occur.

4.1.2 The Risk of Structural Imbalances

In addition to such immediate threats, the use of AI also risks causing severe structural risks and imbalances, with longer-term consequences that are more difficult to anticipate and mitigate, that are expected to be much more widespread and pervasive (see Fig. 4.2). The associated risks will affect all fundamental dimensions of human activity and relations, including the economy, society, and government, as well as international and strategic affairs. The structural imbalances are not only outcomes of autonomous decision-making itself, but also of how humanity actively employs the technology. AI is deeply interwoven with human behavior, thereby exacerbating rather than changing the current path of history.

Economically, mass labour displacement, underemployment, and de-skilling are some likely outcomes of AI and robotics-based automation. AI directly competes with human intelligence, which was spared from automation during previous industrial revolutions. Moreover, AI can not only target knowledge work but continue

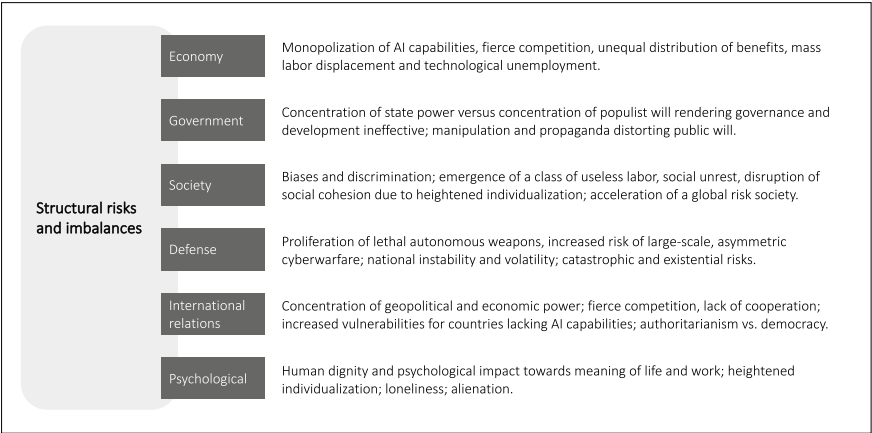


Fig. 4.2 Structural risks of advanced and widespread artificial intelligence. *Note* Based on author’s own research

automating the physical labour that escaped previous waves of rationalization. Many workers might not be able to reskill from jobs of execution to exploration, from repetition to dexterity or creativity, and from non-social to social interaction and empathy [cf. 72]. It is not only a question of whether AI robots will replace workers or become co-workers, but also the extent that workers must behave like robots, exemplified in the case of algorithmic-controlled manual jobs [73]. In addition, market forces have already caused the concentration of data, AI technologies, and human talents. Whereas governments have started investing billions into AI related research and development, such work has increasingly shifted from publicly-funded to privately-owned laboratories of large AI platform companies, which are less willing to share their intellectual property for the social good. While the Internet initially lowered hurdles to setting up businesses, AI raises the bar again, which may lead to digital kleptocracies and AI mercantilism or technology feudalism if the zero-marginal-cost platform economy remains unregulated.

Widespread automation and aging societies reduce the labour force and labour as a major source of tax revenue. While rich countries can afford a universal basic income for those who will not be able to re-skill, low and middle-income countries cannot afford the same and risk becoming trapped in their stages of development. AI coupled with data—the “new oil” on which machine learning thrives—will disrupt the global division of labour. Smaller and less developed countries that can’t catch up with advanced automation to improve their competitiveness will be left further behind. Labour, and especially cheap labour, will not provide a sufficient comparative advantage and catch-up potential in the future. Thus, the previous development models, which were historically reliant on the absorption of rural labor, will become obsolete. Income inequality has already reached alarming levels, not just between rich and poor countries but also within the rich countries. The United States has the most unequal wealth distribution among all OECD countries. While a small group

of transhumanists will be able to afford and enjoy the privileges of digital upgrading, the number of those who are left behind will likely increase and swell the feeding grounds for social unrest, populism, and nationalism. Before societies can change the meaning of labour and find new sources for improving human dignity, intelligent automation risks reinforcing individualism, alienation, and loneliness, and threatening both physical and psychological well-being and social cohesion.

State and political actors will make more use of AI technologies. While businesses employ AI to more precisely segment populations as consumers and compete for their attention, political and state actors do so to better understand citizens as persuadable voters, followers, or potential security threats. This can help make countries more secure and the political process more efficient, but only if AI is used responsibly and balances between economic growth, social good, and national security. However, AI increases the structural risk of shifting the power balance between the state, the economy, and society by limiting the space for autonomy. Through AI-enabled mass surveillance, psychological operations, and information campaigns, states and political actors might seek to acquire a disproportionate amount of power or amplify populism. The two poles of this political risk scenario are totalitarianism and tyranny of the majority. In both cases, the struggle over power dominates the struggle over progress and threatens the pillars of the modern state [cf. 74]. While an authoritarian state could slide into a totalitarian regime by exerting pervasive state control and repression of differences, democracies could witness the erosion of their institutions, the polarization of their entire societies, and the disintegration of their public morality and the manufacture of consent. Unfortunately, the world may already be sliding towards either pole of political imbalance. AI is not the cause, but it is an increasingly weaponized tool used both within and beyond national boundaries to disrupt the political process of adversarial countries. The Edward Snowden (2013) and Cambridge Analytica (2018) affairs are the most known and disturbing evidence of widespread cyber espionage, privacy violation, manipulation of public opinion and interference in the democratic process within the West [also cf. 59]. Conversely, the West frequently accuses Russia, China, North Korea, Iran, and Syria of state or state-sponsored cyber intrusions and attacks and of pervasive mass surveillance.

A fierce global competition over AI supremacy is already raging risking to disrupt existing international relations. All the leading economies have laid out or updated their AI national strategies with the goal of promoting the development of nascent AI capabilities and ecosystems and to be able to compete globally. The Russian president, Vladimir Putin, bluntly stated the strategic importance of AI in 2017 when he said, “Whoever becomes the leader in this sphere will become the ruler of the world”. The United States is leading the race followed closely by China. Whereas the United States wants to maintain its “leadership in AI,” China aspires to become the “primary center for AI innovation” by 2030. Europe also seeks to become the “world-leading region for cutting-edge AI” but it lags behind the United States and China in its number of AI talents and businesses, filed patents, published research papers and investments into the AI industry for research and development. While the United States and China are leading in information and transaction based digital platforms, Europe (Fig. 4.3) seeks to utilize its manufacturing and industrial capability and

the ongoing rush by many states to obtain offensive cyber capabilities for potential use in conflict, the actual risk of international cyberconflict and cyberwarfare has increased significantly—e.g., the use of digital technology by one country to disrupt vital digital systems of another country. Such a proliferation of technologies also holds considerable risk of “friendly fire” and “second order consequences,” because many cyber networks rely on some private sector infrastructure. There are various international organizations dealing with cybersecurity and cybercrime, but the realm of AI-enabled cyberconflict lacks international treaties and attempts to build familiarity, mutual trust, and confidence, especially between rival powers. Furthermore, the discourse on cybersecurity and cybercrime-prevention is globally fragmented, and conventional arms-control treaties are being repudiated or put into question.

4.2 Tarrying with the AI Governance Gap

The rapidly emerging and increasingly materializing landscape of AI risk and dystopian scenarios have sparked an international debate about the ethics and governance of AI. This debate has resulted in the definition of numerous normative principles and frameworks worldwide as well as the emergence of governance networks and polycentric structures that advocate for a responsible or human-centered use of AI [48, 77], including our proposal for the establishment of a “G20 Coordinating Committee for the Governance of AI” [63]. Such projections have also triggered the rise of a comprehensive AI governance research agenda [6]. The various soft and hard governance frameworks commonly emphasize that future AI should be secure, safe, explainable, fair, and reliable, and they also emphasize that its benefits should be distributed across society.

Regarding hard governance approaches, the European Commission (Fig. 4.4) proposal of April 2021 [78] and China’s (Fig. 4.5), already adopted national AI law, of March 2022, are designed to mitigate and prevent AI risks. Although both sides take a precautionary or ex ante-based approach towards the use of AI applications, there are considerable differences, which are mainly related to government use of AI technologies and access to data. As highlighted earlier, for public and national security and criminal investigations, the Chinese government retains the right to use AI for mass surveillance or social scoring, both of which are prohibited in the EU. As such, China’s approach clashes with Europe’s values and fundamental rights-based approach, which underly the AI act proposal and other security and privacy legislations. EU values and rights include the respect for human dignity; freedom of the individual; respect for democracy, justice and the rule of law; equality, non-discrimination and solidarity; and citizenship rights.

In comparison to the EU and China, the US lacks a federal legislation that addresses AI technologies, or the risks associated with cybersecurity and data privacy. However, some individual states have started regulating how the police can use facial recognition technology to avoid mass surveillance and there are several states that are prepared to consider data privacy legislation, similar to Europe’s General Data

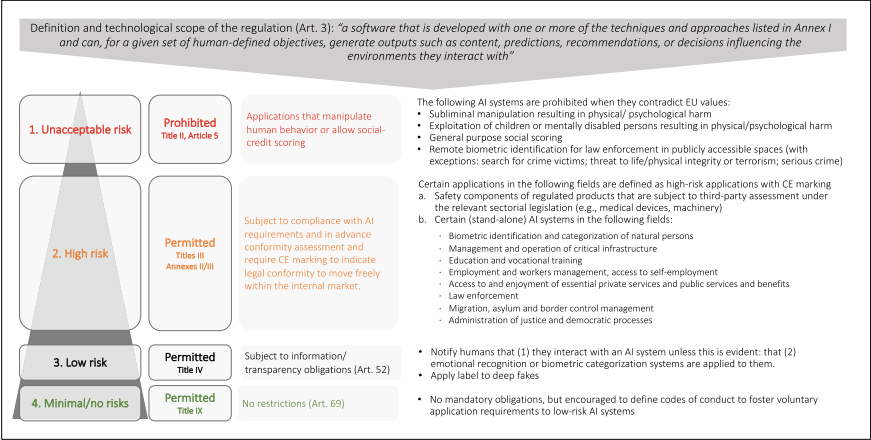


Fig. 4.4 The artificial intelligence act proposal by the European Commission. *Note* Figure derived from *Artificial intelligence act* by T. Madiega, 2021, European Parliamentary Research Service, Brussels

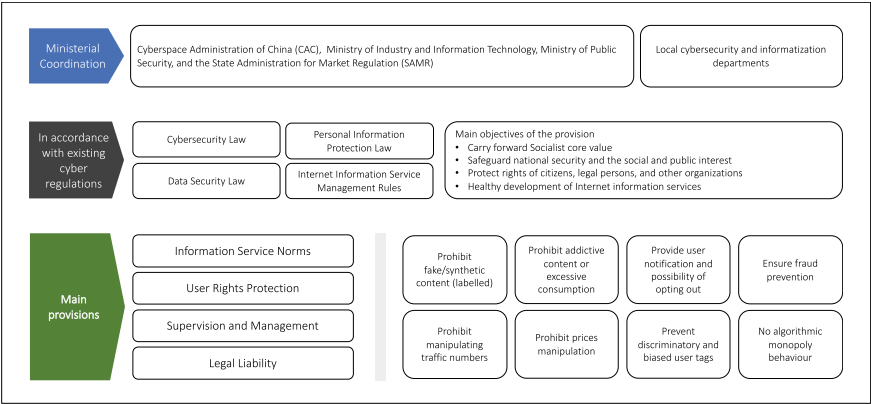


Fig. 4.5 Overview of China’s artificial intelligence law. *Note* Author’s own research

Protection Regulation (GDPR), which could restrict the use of AI. On the federal level, there are only proposals regarding gender and race discrimination (Algorithmic Accountability Act proposal) and prohibiting the amplification of harmful content. Even if the US Senate were to pass a federal law, which is unlikely, it could still pre-empt stronger state laws.

Nevertheless, there seems to be an international consensus that AI should be developed and used for the greater good of humanity. It should be human-centric, responsible and trustworthy, and it should always retain human agency and human oversight. AI should not only enable sustainability, but it should be sustainable itself. Governance is largely understood as the possibility for collaboration guided by common

goals and principles. Soft AI governance includes voluntary restrictions related to innovation and experimentation, as well as self-regulation and self-assessment, regulatory experimentation (e.g., sandboxes), and standards and certification. In contrast, hard governance involves binding laws and regulations, outright bans and moratoriums. The UNESCO Global Agreement on the Ethics of AI, which was signed by all 193 member states in November 2021 (apart from the United States and Israel which are not UNESCO members), is the most prominent globally adopted, yet non-binding, AI governance framework [79].

The overall emphasis on responsible AI suggests a general mismatch or insufficient overlap between the principles of responsible AI and the existing differences in values and collective behavior of stakeholders. Today's ethical principles and governance seem ill-equipped to prevent or sufficiently mitigate the disruptive forces of AI, which are clearly of global and historical proportions. While a set of AI principles has been defined rapidly, the implementation of respective governance approaches—and thus collaboration based on common goals and principles—are emerging only slowly and are challenged by a governance gap. The reason for such a gap is that AI governance operates upon the constitutive void of AI's dual-use dichotomy. As such, the uncertainty or difficulty to bridge that gap and reach responsible AI conduct is certainly required for the rapidly emerging yet still speculative nature of AI. Existing regulations and regulatory approaches do not match such complexity, nor can they match the pace of AI's advancement and adaptation. Initially, this mismatch reinforces awareness of and increases the governance gap. However, this does not explain the nature of the gap. Rather, AI's dual-use character does not provide a simple choice between doing good or harm, because the good-or-harm dichotomy manifests as a constitutive “void” that is already occupied by broader historical developments, patterns of human behavior, and dependencies that structurally prevent the closure of the governance gap. For example, while common data standards are important to a seemingly functional 5G-enabled digital economy, they also help the Pentagon “to connect sensors, deciders, and shooters from across all its services and domains into a theatre-wide, or potentially global, battle network” [80]. Face recognition that is used for convenience is also used for military drones. In addition to traditional defense companies and in particular, since the Ukraine war, private sector companies like Tesla or Google are increasingly involved in the improvement of cyberwar resilience. Thus, AI governance continues to face the absence of a clear choice and can only aspire for the good to sufficiently outweigh the harm. More concretely, there are at least two structural forces that dominate history and thus fill the void: (1) undermining the governance of AI and (2) risk turning responsible principles into a mere ideology of history's current trajectory of capitalism and technology determinism. Both forces also determine the AI landscape of direct threats and structural risks outlined above (Figs. 4.1 and 4.2).

Firstly, capitalism dominates the global economy and like technology lacks the ethic of social and environmental good. Capitalism fosters competition and innovation but also leads to a concentration of resources and an asymmetric distribution of technology and institutional power. Thus, as a new source of efficiency, AI is primarily a tool for economic expansion and rationalization, thereby creating

new value but also repeating existing, and causing new, forms of disruptions and inequality. Secondly, the deeply rooted belief in technology as a universal approach to solving humanity's challenges presents an obstacle to human progress itself. An overreliance on technology can falsely suggest easy solutions for complex problems while omitting the political dimension of global problem solving and the repressive dimension of modern technology itself. Both capitalist productivity, in combination with technology determinism, have already created a path dependency from which humanity cannot simply depart and, which carries the dual-use character of AI technologies forward in history. Despite knowledge of the risks, AI is undergoing rapid advancement and widespread diffusion. However, almost all frameworks analyze the risk of AI in a narrow sense or conveniently ignore the dominant structural forces. In the near future, as AI increasingly makes autonomous decisions it will not escape, nor be completely autonomous from, human practices and, it cannot be expected for it to become a transcendent, super-beneficial, and human-centric compass directing humanity towards universal equality and dignity. Instead, most frameworks ignore how AI will most likely reinforce, rather than alter, the current trajectory of history, which has clearly entered a dangerous downward spiral of economic, societal, political, and international relations. How technology solutionism has kept climate action on a failing trajectory is discussed in the next section.

The structural void becomes most visible during the moment of governance failure or when diverging cultural values and a political system fill the void. In 2021, the European Union [81] and China [82] released their proposed AI regulations that become legally binding once adopted. The United States still lacks such a federal legislative proposal, but various government agencies, including the White House [83], have proposed guidelines for responsible AI. All three economic blocs emphasize responsible AI, but the meaning of responsibility significantly differs across the three regions and is not only a cause of hostility between the West and China, but also between the EU and US.

The United States is a market foundationalist economy and individualist society following the motif of profit and personal self-fulfillment. The government emphasizes AI as an opportunity for R&D, growth, and job creation. While cybersecurity risks are treated as a liability, AI mainly serves the capitalist ethic of self-directed wealth creation. In contrast, Europe emphasizes solidarity and a fundamental rights approach to AI. According to the European Union, AI should be lawful, robust, and ethical; thus, the mitigation of AI risks is a matter of regulation and intervention. The proposed AI Act in Europe seeks to capture EU values but is also largely criticized by the sector for potentially constraining, rather than promoting, Europe's AI and digital competitiveness. In China, harmony and compassion are emphasized as the country's overarching virtues. For China's government, data and AI are a means of maintaining or improving stability and discipline through surveillance and control. Like the EU, China takes a risk-based approach. Undoubtedly, such polarization risks the omission of the many differences within, and similarities across, the regions. People in Europe, America and China have become increasingly aware of the privacy and security risks related to ubiquitous digitalization and AI. Governments have hastily sought

to create a balance between security and autonomy with the goal to harness the benefits while simultaneously minimizing the risks. Large digital platforms have been pushed to become more responsible, after increased public pressure, and face record legal fines being broken up. The big powers face similar digital transformation challenges, yet they approach them differently, which undermines the prospect of global governance in AI. Although similar AI governance principles have been selected, the meaning and priority of certain principles differs considerably. As mentioned above, the differences are firmly rooted in the history and cultures of the regions and have recently become amplified. Both the United States and China have lost patience with trying to understand one another's position after a long period of rapprochement [84]. Instead, they forcefully articulate and defend their otherness. Thus, understanding the systemic differences, especially between the West and China, remains crucial for understanding and tackling the crisis in global governance and navigating the digital transformation. Those differences will be discussed in more detail below.

4.3 Widespread AI Adaptation Remains Inevitable

Technology rendered possible the Industrial Revolutions (IRs). The First Industrial Revolution (IR) used water and steam power to mechanize production and systemize physical human labor. The Second, harnessed electric power to engender mass production. The Third utilized electronics and information technology in the effort to automate production. The current, Fourth Industrial Revolution (4IR), which is rooted in 3IR, has increasingly blurring the lines between the physical, digital, and biological spheres. Its rapidity, in terms of research and innovation, has no historical precedent and is evolving at an exponential rate. The 4IR impacts virtually every industry in every country and in every sphere of human interaction, challenging both our understanding of humanity and what it means to be human in the future [85]. With each industrial revolution, the scope and impact of telecommunication has increased tremendously. During the 2IR, both telegraphy and telecommunication were initially commercialized in the 1840s and 1870s, respectively. Telegraphy had become the “nervous system of commerce” of its time [86], while telecommunication still largely remained a strategic but separate infrastructure during 3IR's rise of mobile communication. Today, telecommunication has become an all-encompassing driver, enabling the infrastructure of the 4IR, and becoming the “nervous system” of all domains of human relations and activity. Meanwhile, humanity is experiencing a comparable development, although faster adaptation, of artificial intelligence—why is that the case?

Despite potentially unprecedented risks, technology determinism still leads to AI's widespread adaptation, not only due to its vast efficiency potential but also to a deeply rooted belief in science and technology [2, 8, 15]. Science, as the basis of technology and the expansion of capitalism since the first industrial revolution, has determined our Anthropocene age and created a path dependency from which history cannot simply depart. Science is “the ‘Real’ of our historical moment, that which

‘remains the same’ in all possible [...] symbolic universes” [33 p. 38]. Science and technology, which characterize the modern world, remains for the most part, beyond people’s control [cf. e.g., 49, 50]. Although science is a human artefact, it is not a mere social construction or an expression of the interest of a certain group. As Slavoj Žižek has pointed out, science cannot easily be replaced by another cognitive dialectic based on hypothesis and verification. As a result, modern life is intrinsically related to continued objectification in terms of mathematical laws. As alluded to above, scientific drive and capitalist productivity constitute two fundamental ethics that explain why AI’s dual-use dichotomy and the void it creates are carried forward in history. This explains the overreliance on technology for solving human problems, even though technology determinism is also part of the problem. While science has been the primary force behind human emancipation, it also has a repressive dimension, as its laws limit the space of autonomy and subjectivity. Hence, the fear of dystopian AI lies in its potentially all-encompassing objectification of human experiences. The access to all factual knowledge might not only threaten jobs, undermine social cohesion and shift power relations and equity, but also deprive humans of the subjectivity through which autonomy and freedom is experienced [32 p. 148]. Consequently, social and environmental good are understood, not as an intrinsic outcome of techno-scientific and capitalist economies, but as warranting political interventions and decisions concerning ethics and governance.

4.4 The Prospects of Intelligent Decarbonization

Tackling the climate action gap is equally, if not more, a complex task than addressing the AI governance gap. For example, Eric Schmidt has emphasized the need of a “kill-switch” for misdirected AI [75]. There is none for climate change. Overcoming the climate action gap or preventing large sets of system elements from turning into tipping points requires breaking through the structural inertia maintained by national, political, and economic interests, which have transformed humanity into a geological factor. This structure created tremendous wealth based on the excessive use of fossil fuels, and nothing is more tied to energy use than economic activity. For the dominant linear economy sustainability poses a contradiction to economic growth; thus, it thwarts the transition to a low-carbon economy.

The circular economy promises to decouple growth from environmental pollution and waste generation [87] by breaking through structural and psychological inertia. Decoupling economic development from fossil fuels, environmental pollution, and waste generation, ultimately requires altering the mode of development and the very fabrics of modern civilization. Yet, great power rivalry, protectionism, geopolitical tensions, fierce competition, post-pandemic recovery, and currency conflicts, as well as social tension and populism all risk perpetuating the fragmentation of the climate action regime. Crucially, for the Global South, which is the least responsible for climate change, this means catching up with the West is no longer feasible based on the West’s own history of industrial development. Neither can the Global South

rely on the old development model, nor be able to acquire the financial resources, human capital, robust institutions, and the technology for a circular economy-based development. To safeguard its own interests, the West is obliged to help the Global South.

Despite such prolonged lack of progress there has been positive momentum for global collaboration on climate action. In 2021, at a series of back-to-back high-level climate action meetings and conferences, Europe, China, Japan, South Korea and the United Kingdom made unilateral commitments, and the United States, under President Biden, returned to the Paris negotiation table. The U.S. seeks an emission reduction of 50% by 2030 based on 2005 levels and achieve a carbon-neutral electricity system by 2035 with the aim of becoming net-zero by 2050. Europe seeks to become climate neutral by 2050 and reduce 55% of its emissions by 2030 compared with 1990 levels. China seeks to peak before 2030 and become carbon neutral by 2060. For the first time, India has also pledged net-zero carbon emissions by 2070, two decades beyond the 2050 target set by the Paris Agreement in 2015. Furthermore, the increase in mainstreaming of climate and sustainability standards in industrial policies and international trade and investment agreements provides the potential of breaking the deadlock of the UNFCCC Conference of the Parties (COP).

Both the EU-UK withdrawal agreement in 2020 and the EU-China Comprehensive Agreement on Investment (CAI)—which has been put on hold due to a diplomatic spat between the EU and China—include provisions or uphold common standards in the areas of climate change and green investment. In addition, the People's Bank of China has committed to collaborate with the EU on establishing a common green taxonomy, which provides common definitions required to effectively reorient capital flows towards a more sustainable economy, while maintaining the financial system's stability. The EU Taxonomy Regulation as well as the Sustainable Finance Disclosure Regulation (SFDR), which requires the disclosure of any negative environmental and social impacts of investments, are deemed the most significant development to date in financing sustainable growth. China also seeks to positively impact and drive the global agenda on climate change with the Belt and Road Initiative (BRI), International Green Development Coalition and the Green Investment Principle. The Chinese government has also increased its efforts to standardize and introduce environmental, social, and governance (ESG) disclosure rules.

The international progress in climate and sustainability standards has the potential to be translated into templates used to reform the World Trade Organization (WTO), accelerate energy transition and support a rapid evolution to an economy aligned with the Paris Agreement and the United Nations' Sustainable Development Goals (SDGs). Such developments might anticipate an emerging economic model, in which, sustainability becomes the primary incentive and most rational choice. However, climate action based on the remaining global budget for CO₂-equivalent emissions, to reach and sustain no more than 1.5° global warming by 2035 according to the Intergovernmental Panel on Climate Change (IPCC), remain ambitious, yet probable.

While climate goals and measures are increasingly converging across the major regions, there are still diverging domestic priorities and possibilities. China and the U.S. remain critical towards the EU's proposed carbon border tax perceiving it as

protectionist. The EU, however, emphasizes that European companies should not be put at a disadvantage over the bloc's adopted climate targets. All sides agree to further mainstream environmental principles in policies and economic agreements, to address market distortions and to include the principles in investment decisions. Meanwhile, disagreement remains over introducing widespread carbon border adjustment mechanisms, emission trading systems and a global carbon or greenhouse gas (GHG) tax regime. Although a strict climate action regime may endanger China's transition from a middle-income to a high-income economy, the U.S. remains entangled in its market-foundationalist values opposing more fundamental changes, however, Europe's status as an export-led economy more easily justifies relatively stricter regulations. While the EU and China are leading the transitions towards carbon neutrality, the U.S., despite its ambitious goals, continues to lag behind, but could inspire Canada and Australia to become more ambitious. Both Canada and Australia, have a significant carbon footprints and are lagging even further behind in relative terms. The war in the Ukraine has demonstrated continuing fossil fuel dependency and sharply increased the prices of oil and gas. Depending upon the responses of consumers, businesses and governments, the longer-term impact of such an unprecedented shock remains unknown, but variance remains with some governments accelerating and others reversing energy transition activities.

Technology, which has been assigned a dominant role for closing the climate action gap, has demonstrated little success, however, the rise of AI offers a new opportunity. AI has been attributed the potential to help realize the United Nations SDGs [65], including the key objective of decarbonization [88]. Thus, at the intersection between AI and climate action, the concept of intelligent decarbonization (IDC) has emerged as a new solution to curb climate change more effectively. A promising study carried out by the Cambridge Centre for Advanced Research and Education in Singapore (CARES) and the Swiss Academy of Science [67], which analyzed various IDC cases from leading business and research organizations, highlights that AI, in combination with cyber-physical systems (CPSs), can significantly contribute to the reduction, elimination, or removal of carbon dioxide emissions. An IDC-adjusted marginal abatement cost curve (see Fig. 4.6) shows a significantly higher potential for emissions reduction and lower costs of avoiding 1 ton of CO₂ compared to conventional decarbonization approaches. In addition to direct decarbonization measures, an IDC-based CPS approach can also contribute to the mitigation of unavoidable consequences, including planning for resilience and disaster recovery related to the impact of storms, droughts, fires, and floods on the environment, economy and society. It can also contribute to the optimization of decision making related to markets, policies, and consumer behavior. With the further advancement and adaptation of AI, IDC can target all major sectors of greenhouse gas (GHG) emissions, including energy provision, industrial production, transport management, urban organization, and land use.

The concept of IDC highlights how AI research and applications are increasingly geared towards industry and resolving global problems related to climate change and energy transition. Moreover, IDC also helps address global challenges related to health, food, water and mobility, which lie beyond its initial focus on consumer attention and surveillance. In the AI sector, there is arguably, a growing awareness

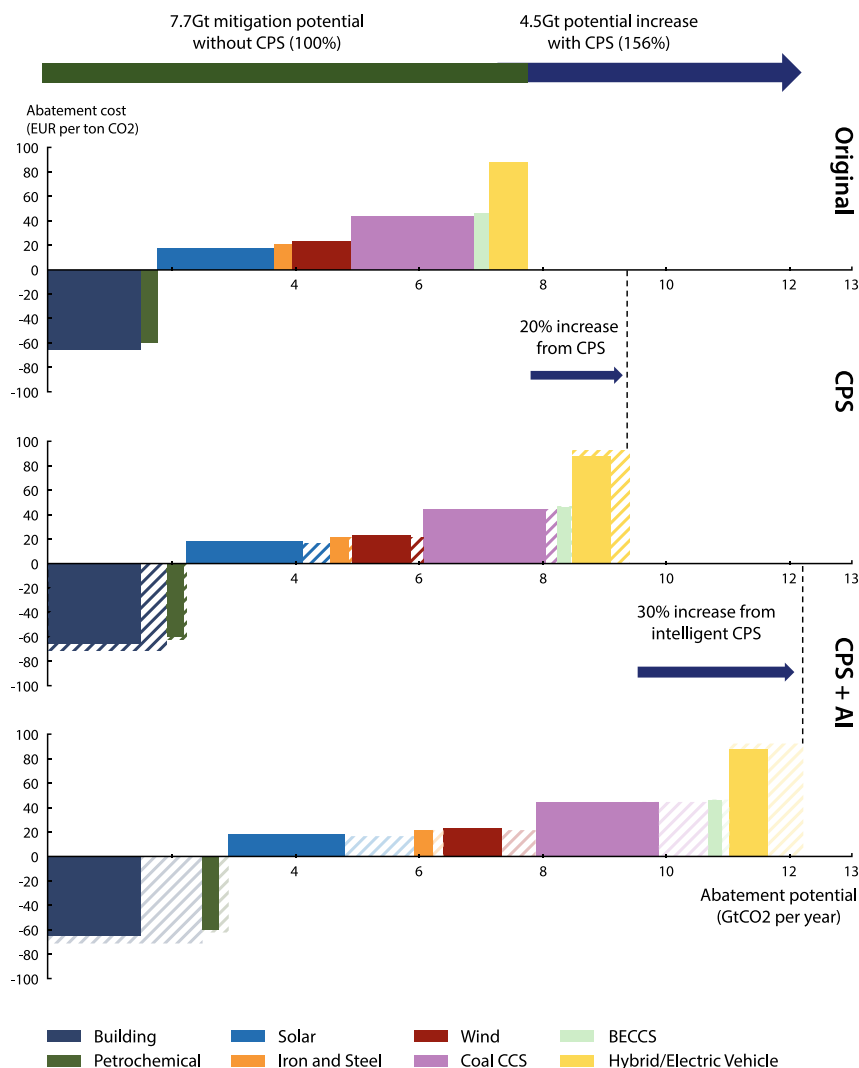


Fig. 4.6 Intelligent decarbonization-adjusted marginal abatement cost curve. *Note* Adopted from *Intelligent Decarbonization. Lecture Notes in Energy* (p. 24) by O. Inderwildi and K. Markus (Eds.), 2022, Springer Nature

about the need to focus on social good and a shift from AI as a tool primarily used for technology problem solving to one of dilemma optimization, which takes into consideration the aggregated impact of AI towards society, economy, politics, and the environment. Within the big technology sector there has been a shift from technology optimism to precautionary optimism or technology realism. However, transformative

AI applications for public goods are still in the early stages, and less than 1% of AI-related research publications in 2020 tackled the question of sustainability [89].

At this early stage of AI development and deployment, IDC usage remains largely speculative. Thus, to avoid presenting this emerging domain of climate action as a digital utopia that will resolve today's contradiction between economic growth and sustainability, proponents of IDC also warn against its technological limitations and broader nontechnological factors that could prohibit the realization of the SDGs and represent barriers to the important goal of decarbonization [65, 66]. The technological limitations are related, but not limited, to the availability and accessibility of abundant, high-quality data as well as of CPSs; the potential lack of adaptability of AI solutions across sectors and regions; unintended reverse effects of optimizations that could strengthen rather than change the existing carbon-based energy system and the immense energy consumption of AI itself, which is counterproductive if energy sources remain based on fossil fuels. In contrast, nontechnical factors refer to potentially negative impacts on the environment, economy, and society due to the widespread diffusion and application of AI—as highlighted in detail above. While the resolution of technological limitations is largely a matter of science and engineering, the structural factors refer to existing historical forces as well as an overreliance on technology itself, which becomes reinforced through AI. Thus, IDC not only faces the prolonged climate action gap. But more recently AI's own governance gap, both of which risk undermining the impact of IDC and the fight against climate change.

4.5 The Reverse Effect of Technology or Technology Determinism

Despite the prospects of intelligent decarbonization, a technocratic approach to climate action has not facilitated the change required for a rapid transformation into a carbon free economy. Rather, over the past 40 years, a slowly manifesting political will to act against climate change has been accompanied by an overreliance on technology as the primary solution. As a matter of caution, AI provides promising solutions for decarbonization, but also introduces, as discussed above, a structural void shaped by broader historical developments, economic and political interests, and an emphasis on AI and digitalization as a matter of fierce competition, national security, autonomous technology choices and digital sovereignty.

Slavoj Žižek [90: 145 pp, 91] provides a more fundamental explanation that accounts for both prolonged climate inaction and, paradoxically, the recent push toward climate action, which is humanity's changing understanding of itself in relation to nature, science and technology. Humanity, certainly in the West with its monothetic legacy, has positioned itself at the "ontological" and "moral center" of the universe, as a "protagonist" with an urge to subordinate and control nature. With the emergence of modern sciences, humanity witnessed three "blows" against

such anthropocentrism and human centeredness. Firstly, the Copernican Revolution of the fifteenth century proved the world was not the center of the universe. Secondly, Charles Darwin's theory of evolution (1859) conveyed that humanity was not "God's favored creation," but a result of "fortunate accidents." Thirdly, the rise of psychology, and notably Sigmund Freud (1865), revealed that humans are not masters of our minds, and that reason is not at the center of mental life. Baruch Spinoza (1632) had already anticipated the latter revelation when he emphasized that forces beyond human control determine individual human being.

Paradoxically, while humanity's identity became decentered, modern science and technology, which is a human artefact, moved to center stage. Technoscience has been the primary force of modernization and made possible the four industrial revolutions. Thus, its application is responsible for polluting the atmosphere and degrading the biosphere. Over the past forty years, the slowly emerging political will to act against climate change has been accompanied by an overreliance on technology as the primary solution to climate change. Such potentially dangerous over-reliance on technology is signified by the emphasis on "climate neutrality" or "carbon zero," and thus on the focus of carbon capture and storage; plant-based and geological carbon sinks; overshoot scenarios through geo-engineering; and models to calculate how investments and technology could change carbon or GHG emissions.

Emerging throughout the course of past climate conferences, including Rio (1992), Kyoto (1997), Copenhagen (2009) and Paris (2015), the technocratic approach towards climate change has determined climate policy, which has largely failed leading to merely incremental regulation changes. Although the Paris Agreement and the more recent convergence of pledges and measures signified a breakthrough in terms of global political willingness to fight climate change, the prolonged reliance on carbon reduction and geoengineering technologies might have turned the Paris Agreement into an unfeasible political victory. In other words, the reliance on technology prevented politics from making earlier and more profound changes.

The recent push towards climate action is grounded in the collective awareness and fear about not only our individual human finitude, but also the impotence and insignificance of human beings in the greater context of nature. Humanity can destroy nature, but not simply reverse the destruction and thus simply control nature. This revelation appears as the "final assault" against anthropocentrism and may take decades to materialize. As such, scientists argue that the 1.5 °C goal is not feasible, but rather, that humanity should prepare for a potentially attainable 3 °C goal by the end of this century.

Both climate action and artificial intelligence are connected in the sense of humanity's overreliance on technology, but the awareness that technology alone cannot resolve global challenges. Instead, global political will is needed. Climate success is a matter of global governance, which is the possibility and necessity of global collaboration. There is no time for great power rivalry. Governance mechanisms that emphasize commonalities are necessary, but which respect differences and the joint will to overcome difference over time. Governments need to develop technological solutions, as much as elaborate solutions, to technological barriers and unintended reverse effects of optimizations. Governments also need to jointly

elaborate solutions for non-technological factors that overcome governance gaps and mitigate negative impacts on the environment, economy, and society. More immediate and sustained cuts to GHG emissions might become inevitable, but those cuts must be achieved in socially just ways.

Chapter 5

Race to the Bottom



Geopolitically, the twenty-first century is being determined by the relationship between the United States and China impacting all other spheres of relations, including the urgent need for global collaboration on climate change and on the disruptions caused by the digital transformation and the 4th Industrial Revolution. Fifty years ago, Richard Nixon's visit to China marked the beginning of the United States' detente with China after decades of isolation. However, since that time and the market-oriented reforms and opening up of its economy from 1978, China continued to upset Western expectations. China has been accused of either violating human rights domestically or ignoring laws internationally, and China's growing economic power and rapidly developing military and technological strength has caused concern in the West. Since the formation of the People's Republic of China in 1949, its borders and sovereignty have remained contested by the West until today. In retrospect and according to Kurt Campbell and Ely Ratner [92], the relationship between China and the West, especially the United States, unfolded as a regression from presumptuous optimism and rapprochement to skepticism and containment. For Jon Bateman [93: 10], "US policymakers and political leaders have developed much darker views of China over the past decade."

For some time, America continued to remind China of the claim to universality of Western liberal democratic values. It was believed that once a prosperous middle class emerges and economic liberalization were achieved, China would inevitably turn in to democracy. In the 1980s, George H. W. Bush asserted that China could not just import Western products "while stopping foreign ideas at the border". In the 1990s, Bill Clinton declared that without freedom and democracy, "China will be at a distinct disadvantage competing with fully open societies". Yet, under his presidency the relationship experienced a historic low related to the allegedly accidental 1999 bombing of the Chinese embassy carried out by US-led NATO troops in Belgrade. George W. Bush, who was occupied with America's fight against terrorism and deregulating an economy, which led to the biggest recession in history, said that "the people of China deserve the fundamental liberty that is the natural right of all human beings". In the meantime, China's then President Hu Jintao emphasized the

country's "peaceful rise" to reassure the West. From 2009 onwards, with the diplomatic relationship between the U.S. and China having already reached a low point, Barack Obama sought to further contain China by rebalancing military forces and excluding China from the Trans-Pacific Partnership (TPP). He reminded China that it should "uphold the very rules that have made [China] successful" [92]. The tone changed considerably with the election of President Trump. His election campaign had been built on a stage of hostility against China, and for the first time since the rapprochement of the 1970s, an American president referred to China publicly as a "rival", a "revisionist power", and the "primary threat to U.S. economic dominance". President Trump canceled U.S. participation in the TPP, which was intended by Obama to exclude China, but initiated a unilateral trade war and labelled China's trade practice the "greatest theft in the world." His presidency signaled a new low in U.S.-China diplomatic relations, which have further deteriorated under the presidency of Joseph Biden. Less vocally, Biden still referred to called China the "most serious competitor" to the U.S. in his first foreign policy speech of 2021. As Cheng Li highlights, "the new Congress in the first half of 2021 introduced more than 300 China-related bills although most have not become law" [94]. Meanwhile, Donald Trump's unilateral trade war against China has turned into a whole-of-government containment approach (see Fig. 3.4), and the Biden administration now seeks to complete Obama's "pivot to Asia". The Indo-Pacific strategy of the U.S., including the Indo-Pacific Economic Framework (IPEF); the Quadrilateral Security Dialogue (Quad) between the US, India, Japan, and Australia; the creation of the trilateral military alliance between Australia, United Kingdom und United States (AUKUS); the vocal criticism of China's position on Xinjiang and Hong Kong; pressure against Taiwan's independence; occupation of the South and East China Seas; tit for tat coercion against US-led sanctions and decoupling; and China's retaliatory sanctions of individuals and institutions in North America and Europe have added to the tensions and clearly suggest the attempt to push back on China and defend the existing US-led global order. The US does not want to cede precious ground to China on economic and strategic rulemaking in the Asia Pacific region, which is economically the most vibrant part of the world. From China's side, the former ambassador (2013–2021) to the United States, Cui Tiankai, made Beijing's opinion concerning its relationship with the U.S. very clear: "The United States will not willingly accept the rise of a great power with a very different social system, ideology, cultural tradition or even race [...] spare no effort to suppress, contain, divide and encircle China" [95].

Today, there is no longer a widespread conviction amongst Western politicians that China will eventually become a Western democracy. The Western foreign political strategy "change through trade" is deemed a strategic failure, although both sides benefitted tremendously from it economically. China lifted 800 million people out of poverty and more closely aligned with the West economically, but it has not turned into a liberal democracy. Unlike the Western experience of capitalism, trade will not necessarily lead to a middle class that demands Western democratic values and associated fundamental rights. While the Chinese government receives very high approval ratings from the Chinese people, the US-China relationship has reached the lowest point since Nixon's visit to China in 1972. The past cooperation-competition balance

has shifted to a dangerous competition-confrontation situation. A war of words, military movements and cyberattacks have become the most visible and dangerous sign of interaction in addition to the trade war, sanctions and counter-sanctions, as well as increasing economic, technology, cultural, and political decoupling [cf. 93, 96]. “Friend-shoring” or confining trade to a “circle of trusted nations” [97] is emphasized to reduce Western dependency on China. Security and economic competition have deepened to include technology and ideology. To protect its shrinking global hegemony, the United States has been actively building four containment structures as it seeks to rebuild its alliances against China: (1) a democratic alliance to prevent China from changing the global order; (2) a geostrategic alliance to contain China’s geopolitical rise; (3) a global economic alliance to curtail China’s economic and trade influence, and; (4) a technology and standards alliance to prevent China from determining the technological heights of this century.

In the U.S., there is a growing bipartisan push for a hard decoupling with China. The conclusion of a recent Rand report reflects the U.S. political sentiment: “there are risks in competing with China, but the risks of not competing are greater” [98]. However, according to the former special assistant to the Chairman of the Joint Chiefs of Staff, Jon Bateman, there are three different camps taking different position towards the US-China relationship, which highlights competing political positions and the associated risks of decoupling due to the deep interconnectedness between the US and China: restrictionists, cooperationists and centrists. To Bateman [93: 42–43], “restrictionists fear U.S. complacency toward Chinese tech threats, while cooperationists fear U.S. overreaction. Meanwhile, centrists fear U.S. incapacity to navigate between both perils.” The first camp, which is the home of the China hawks, basically wants to “harm and ideally destroy major Chinese tech companies, such as Huawei” [93: 39–40]. In contrast, Bateman identifies U.S. businesses as cooperationists who argue that “US tech restrictions are domestically harmful and internationally destabilizing.” Bateman also identifies Senator Bernie Sanders as cooperationist. For Sanders, a strong confrontation with China “fuels wasteful spending, militarism, bigotry, and authoritarian populism at home while reducing the likelihood of cooperation on key global issues.” Sanders has received support from the French economist, Thomas Piketty [99], who suggests that the only way to challenge China’s rising hegemony is by abandoning the “dated hyper-capitalist model” of the U.S. itself and to promote a “new emancipatory egalitarian horizon on a global scale, a new form of democratic and participatory, ecological and post-colonial socialism.” For centrists, which, to Bateman, is a position mainly taken by mainstream U.S. think tanks and a few moderate politicians, “some degree of disentangling is both inevitable and preferable.” Countering China should be a secondary priority and decoupling only apply to highly sensitive technology areas. Based on Bateman’s classification, the Biden administration is probably leaning against the restrictionist camp, but with less aggressive rhetoric than the China hawks of the Republican party.

Although an antagonistic framing of China has gained political capital since the Trump administration, the need for cooperation or partnership has also been emphasized by the Biden administration. In March 2021, during the first diplomatic meeting

between the U.S. and China after the election of President Biden, the US Secretary of State Anthony Blinken [100] said that “the United States’ relationship with China will be competitive where it should be, collaborative where it can be, adversarial where it must be.” A similar trilogy has been frequently repeated in Europe. During the state of union address in September 2020, the President of the European Commission Ursula von der Leyen called China “a negotiating partner, an economic competitor, and a systemic rival.” Clearly, a purely restrictionist proposition conveniently disregards the point that both sides, the U.S. and China, need to cooperate to prosper in the long run. Not only do both sides remain strongly connected through their persistent high-volume trade relationships, but they both face unprecedented global dangers caused by carbon emissions, new disruptive technologies, rules-based trade, pandemics and nuclear proliferation. Yet, it’s rather questionable whether all three approaches receive the same diplomatic priority and to what extent the mitigation of global dangers and establishment of new trade rules, which require global collaboration, can become an area of rivalry rather than that of cooperation or partnership. Rather, both sides have taken more risk in confronting each other. While the U.S. is frustrated over its relative decline and lack of a grand strategy. China however, which had joined the free-world system at the height of the Cold War, no longer shares the underlying values or offers a credible way to contribute responsibly to that system. Against this backdrop, Russia’s invasion of the Ukraine has added fuel to the fire risking an incendiary effect globally. Although China signed a “no limits” joint statement with Russia shortly before the war broke out, it has taken a “positive-neutral” position towards Russia’s invasion and opposed Western sanctions like the majority of non-Western countries. While China does not promote Russia’s invasion, it seeks to defend its own interests which are mainly to protect its economic development against coercive US foreign policies. The West fears that both Russia and China will form a new autocratic axis that is targeted at upending Europe’s security architecture and the US-led global order. That’s why systemic rivalry rather manifests as the dominant undercurrent determining the relationship for an unforeseeable time.

5.1 The Systemic Differences Between the West and China

To understand the crisis and tensions in global governance more deeply, it is necessary to revisit and analyze the differences between the West and China, especially at times when the United States, European Union, and NATO have respectively labelled China a “strategic competitor”, “systemic rival” or a “challenge to the Western alliance”. President Biden called China-US relations “a battle between the utility of democracies in the twenty-first century and autocracies” and told journalists at his first news conference as president, “We’ve got to prove democracy works” [101]. Revisiting China’s idiosyncratic political system also helps to understand that President Xi’s governance approach is not a regression to the Maoist past but constitutes a continuation of China’s development path and statecraft.

The term democracy is mainly attributed solely as a Western achievement, resulting from the Western history of emancipation, enlightenment and capitalism. Whether China should become a democracy was long debated after the reform and opening-up period. Liberalism, which dominates, but is increasingly cast into doubt within Western democracies themselves, has also been instrumental in China's own modernization and reform. Yet, China has never taken liberalism and democracy as an end for itself, but rather as pragmatic tool to bring wealth to its people and transform the economy, while "escaping shock therapy." Performance and results based on China's long history, culture, and actual conditions and results—and not Western democratic procedures—are seen as essential to China's own political system and development.

And yet, China has defined its own understanding of "democracy," which is an explanation of China's successful development over the past 40 years. Fundamentally, the Chinese government does not act in its own self-interest, but in the interest of the Chinese people, which has primarily meant cushioning the disruptive impact of global capitalism and the country's own rapid transformation. The notion of "the people" has been misused by populist forces in the West or used as attempts to gain political capital. In the US, "the people" has been a persistent theme, including Donald Trump's "forgotten men and women," Ronald Reagan's "we the people," Richard Nixon's "silent majority," or Franklin D. Roosevelt's "the forgotten man at the bottom of the economic pyramid." In China the notion of "the people" receives a different meaning of state responsibility. Over the past four decades, the country's development success is not simply due to the import of Western liberalism and China's late emerging economy, but also because of the communist party's egalitarian and collectivist ethics, which are embedded in a culture reflecting the old "Guanzi symbiosis" between the state and the economy that had already guaranteed ancient China long periods of stability and prosperity [102]. Guanzi (管子) is the name of a series of texts that were compiled by the scholar Liu Xiang addressing the need to calibrate state–economy relations during the Warring States period (475–221 BC). At the center of the Guanzi symbiosis rests the Confucian virtue of benevolence (rényi: 仁义).

Peter Nolan emphasizes that benevolence regularly reminded emperors of their dependency on the people and economy. Since 1949, this concept has been repeated by the leaders of modern China. "China's own recent history under Chairman Mao's leadership provides a vivid illustration of the dangers of excessively simplistic and utopian approaches [...] However, [the socialist institutions] provided an exceptional example of social cohesion and security" [103: 166]. To some extent, they embodied Mao's dictum "'Serve the people' (*wei renmin fuwu*)". Since the renunciation of utopian socialism, the post-1978 administration took the much more potent role of bringing wealth to the people and making necessary interventions to prevent the radicalization of the market into a destructive form of capitalism. The positive use of state power is reflected in China's steady growth and the government's ability to sustain system stability. Well-known statements like Jiang Zemin's "make the past serve the present (*zuodao gu wei jin yong*)", Hu Jintao's "'plain living and hard struggle' (*jianku fendou*)" or Wen Jiabao's "society of all-round 'small comfort' (*xiaokang*)"

(ibid: 166–171) imply that the millennia-old virtue of benevolence continues to guide government action, but under the circumstances of the present.

For Nolan, China's own history and culture has given the Chinese people the "confidence" and "moral cement" to resist not only Western liberalism, but also avoid the arduous path of primitive capitalist accumulation, while still pursuing "desirable social objectives" (ibid: 166). Manifesting independently of Western ideology, the concept of benevolence does not simply occupy a place somewhere between socialism and capitalism. Thus, it can be indifferent to leftist or rightist ideology but still establish a "creative symbiotic interrelationship between the state and market." For Nolan, China's state benevolence therefore constitutes a "Third Way" [103: 175], which was already practiced for two thousand years. China's long periods of stability were based on a combination of the material forces related to the rise of ancient China as an agrarian empire coupled with the cultural demand of Confucian benevolence. Due to the independence of the concept of benevolence from Western history and culture, China's Third Way differs from that of Tony Blair or Gerhard Schröder's *Neue Mitte* of the late 1990s and early 2000s. After the victory of capitalism over socialism in 1989, the real-political agendas in Europe were an attempt to rescue the demolition of the welfare state or the "'first way' social democracy" [19: 100], ultimately, however, they were concessions to the notion that certain levels of inequality, especially income inequality, were inevitable and even acceptable. Although short-lived, Europe's third way was a struggle between dominant Western ideologies, with liberal capitalism gaining the upper hand after the Fall of the Berlin Wall. For Nolan, China's Third Way gradualism did not mean a gradual withdrawal of the state to give way to the market and liberal order. On the contrary, it was the continuation of the one-party system and a strong state that ensured China's stability and ability to "marry the 'hedgehog' of market dynamisms with the 'snake' of social cohesion". Despite the particularity of China's governance and development approach, Nolan [103] also highlighted a moral resemblance between China and the West, that is, between Confucian state benevolence and the work of Adam Smith. Smith is widely regarded as the forefather of capitalist thinking, but for Nolan, he was not a "right-wing apologist" of the market who remained silent about the high costs involved when it was left unregulated and as an end in itself. On the contrary, Smith clearly cautioned about the "damaging effects of unfettered market forces" [103: 175]. However, Smith's capitalist ethics remained dominantly emphasized in the West and his precaution ideologized as a Leftist proposition. At the height of liberalization and deregulation, neoliberals selectively emphasized Smith's capitalist ethics in order to justify and relegate the disruptive impact of unregulated markets as mere side-effects.

The dominant Western conviction is that China is not a democracy. China is often depicted as a Marxist-Leninist one-party or autocratic state capitalist system. However, the former neglects China's ancient history and culture of dynastic change, the latter the social and political control the government exerts over market mechanisms. As indicated above, the state does not simply conspire with capital, but pragmatically intervenes when markets crumble, individual actors gain too much market power, or when pollution and inequality reach unsustainable levels.

China's "benevolent real politics" explains President's Xi's recent shift to a focus on "common prosperity" [104] and a "healthy development of the platform economy" which led to a regulatory clampdown of China's big technology sector [46, see also, 105]. Likewise, China's vision of an interconnected Eurasia—the Belt and Road Initiative (BRI)—emerged as a loosely coupled development platform, yet unparalleled since the time when the United States rebuilt the global order of a war-shattered world. Although no political majority could be reached today with the proclamation of the 1989 Washington Consensus in the West, the BRI is not an international development plan based on neoliberal principles. It follows a long-term conceptual policy agenda and experimental development path towards realizing tangible policy goals beyond a focus on unimpeded trade and investment building physical infrastructure and monetary policy. It also focuses on diplomatic principles and mutual cooperation between China and BRI countries. The Western denouncement of the BRI as a mere geopolitical strategy—with the intention of predatory lending trapping recipient BRI countries in a cycle of debt—is missing the broader objectives of the initiative [106]. The BRI was introduced as a new source of growth and development for China and Eurasia to compensate for a slowing global economy that resulted from the 2008 financial crisis and its aftermath. Nevertheless, the best intentions do not prevent the risks associated with investments into strategic infrastructure projects and the socio-economic disruptions caused by modernization.

Discerning the differences between China and the West in a more systemic way, political economist Francis Fukuyama [74] uses three dimensions to summarize the pillars of the modern Western government: rule of law, legitimacy, and bureaucracy. First, China practices an "enlightened legal system," but not a universal law as in the West. Although China has made great efforts to become a rules-based state, the application of the Chinese law is procedural rather than universal. China's legal practices can be described as "rule by law under the Rule of the Party" [51: 13] or as "rules-based decision-making." The government and state are less constraint by the law and the people have less rights to object to decisions of the state and government or have less judicial remedies through which they can claim their rights. More fundamentally, the Chinese legal tradition also diverges from the Western one in terms of the separation of powers. As shown in Fig. 5.1, China does have a Supreme People's Procuratorate and Supreme People's Court, but both are not independent of the Communist Party of China, which remains as the primary source of power: "Based on the lack of separation of powers, the supremacy of law, legal certainty, and judicial independence, China's legal system cannot be defined as being a liberal democratic system and being a rule of law system by Western standards" [51: 13]). As highlighted above, China has no independent judicial branch that controls and restrains governmental access to data. Consequently, China's legal system, its constitutional rules and secondary norms must be interpreted in relation to China's political system, constitution, and priorities.

Second, the party and government are not legitimized through general elections, but by communist revolution, economic development, government performance, and the country's long history of centralism and unity. As the Chinese government trends to a longer-term view than governments in the West, some argue that the Chinese

system intrinsically demonstrates greater accountability than the short-term orientation of the Western electoral system. Based on various different opinion polls, over 95% of China's population has remained optimistic or positive about China and the central government's performance over the past decade [94]. Approval ratings of Western governments are usually between 20 and 45%. However, the West usually emphasizes the lack of democratic legitimation based on elections as a great weakness of China. China's mode of legitimation is based upon the role of government in providing social and economic benefits for its people. While the spirit of the revolution no longer legitimizes the Communist Party, China's unparalleled economic growth and poverty alleviation fits the purpose. Thus, it is often argued in the West that the lack of permanent economic growth, increasing uncertainty and the emergence of global crises risk delegitimizing the continuation of the Communist Party.

Third, China operates and rules through a strong and complex bureaucracy that has developed over centuries and is more advanced and effective compared to those of other late emerging economies. Fukuyama highlights that China was the first civilization that developed a modern state already around 221 BC that was hierarchical, uniform, and impersonal. Although from a Weberian perspective China's party-state bureaucracy is not fully rationalized and tends to sustain irrational types of domination and thus still differs from Western bureaucracies, it has institutionalized mechanisms that help to identify the demands and needs of the Chinese people and respond effectively to a rapidly changing and uncertain environment. Its checks and balances are intended to prevent the concentration of power and its misuse.

China's party-state structure is a prime example of Chinese bureaucracy (for an overview see Fig. 5.1). In the first half of 2022, the party had around 95 million members, which represents roughly 6.7% of China's population [107]. In comparison, 0.5% of Germany's population are members of one of Germany's parties, from which future elite politicians emerge. As Cheng Li [108] highlights, the Communist Party's central committee, which carries out the decisions of the national party congress and from which the highest-ranking party members are selected, has around 62% turnover rate every five years to ensure fresh representation and ideas and avoid formation or strengthening of factions. An even higher turnover rate of Central Committee members, which represent the party's highest organ of authority, is expected at the 20th Party Congress of the Chinese Communist Party in 2022, and yet, also bears tremendous uncertainties [109]. Unlike in the past, many central committee members have a technical or engineering background to reflect the skills needed to understand and effectively address current development challenges. Cheng Li views the turnover rate of party members as higher than the change of politicians in many established Western democracies. Party member selection and succession is mainly based on competition and consensus. The state also has mechanisms to directly interact with various stakeholder groups and regions, including running public consultations, without which it would be impossible to govern such a large country.

Ultimately, China's political elite decided that democracy based on freedom of expression and association, democratic control through elections and a multiparty system, and the separation of powers to sustain an independent judiciary, is not

suitable for China based on its own history, culture, and current stage of development. Given the West's myriad challenges, including its prolonged legitimacy crisis, increasing populism and nationalism, fragmentation of social cohesion, and inability to respond more effectively to shocks and crises, it is questionable whether Western style democracy would be more suitable for China than China's own system. For China, to rely on a procedural government system based on which Western democracy is grounded could endanger China's long-term development. While the ideals of Western democracy and human rights can be deemed universal, the path towards reaching those ideals is not universal, but depends on specific historical, cultural, and actual conditions. China has lifted millions of people out of poverty—a fundamental human right—and achieved poverty alleviation without liberal democracy. This remains the strongest argument against the West's own history of capitalism. While the world copes with global capitalism, ubiquitous digitalization, climate change, and the pandemic, each region responds to those trends and threats in its own idiosyncratic way. Risking oversimplification, the U.S. approaches challenges from an individualistic perspective and China from a collectivist view. The challenges are the same, but the approaches are diametrically opposed and have caused systemic tensions. This is in addition to the different stages of development that require different measures and forms of government intervention as highlighted above. It is irresponsible or naive to assume that non-Western countries, notably China, can bypass history and the arduous process of modernization in order to become a rich modern state and society, and yet China has already considerably shorted a process that took hundreds of year of enlightenment and modernization in the West.

5.2 Groping for the Way Forward in a New Era

When Hu Jintao became president in 2003, Peter Nolan [103] highlighted that “China was at the crossroads” facing a critical point, like it had in 1978, that demanded crucial decisions by the political elite to avoid system disintegration. China was experiencing soaring levels of inequality and uneven regional developments, rampant rent-seeking and corruption, malpractice in financial institutions, lack of progress in the state-owned enterprise (SOE) sector and competitive multinationals able to thrive in international markets, as well as the lack of sustainable growth and environmental deterioration [103, 110]. To tackle the myriad of domestic issues, as Nolan pointed out [103: 60], China didn't choose a “return to the ‘mass line’ of the Maoist period” but continued following the same direction as China had followed since 1978, that is, “groping for the way forward” to address and seek to resolve the challenges in a pragmatic and experimental fashion [also cf. 111].

A comparable situation applied to Xi Jinping when he was selected as president in 2013. China was again at the crossroads. It was experiencing rampant corruption, a dysfunctional party-state apparatus with low party moral, lack of party legitimacy, and prolonged inequality. Hu Jintao's goal of building a “harmonious society” had

slipped further out of reach under his presidency. However, the global context had considerably changed compared to that of the beginning of the 2000s. As discussed in more detail below, the global economy had become much more uncertain and volatile by 2013. Capitalist globalization started crumbling under the financial crisis in 2008 and its aftermath, and the US had become much more assertive towards China. Even the Western liberal democratic system, which created the highest level of human dignity in the twentieth century, was no longer to be regarded as the panacea for the disruptions of global capitalism. Thus, to tackle domestic challenges and respond to the new global context, the communist party under Xi Jinping deliberately decided for more centrality domestically, a more assertive foreign policy, as well as increased technological and economical self-reliance. The demand for more centrality is equivalent to the heightened demand for more sovereignty in the West, yet with “Chinese characteristics.” In such a context, the abolishment of China’s presidential term limit in the Constitution of the People’s Republic of China in 2018, which allows Xi to exceed the two-term limit as general secretary of the Communist Party, was more an act of ensuring leadership continuation and stability than simply one of power grabbing and returning from “collective governance” to a “single man rule” or stepping from “autocracy into dictatorship.” Unlike Carl Minzner’s hyperbolic warning [112] that President Xi equated to “the end of reform and opening up,” China’s government remained embedded in its culture of “benevolent real politics.” It is absurd to think that Xi Jinping could change the culture of statecraft that has grown over millennia in China and has a party of 95 million members. On the contrary, China’s gradual reform approach will continue under President Xi. However, as China’s statecraft has swung back towards more centralized control, its gradualism differs from that practiced under Xi Jinping’s predecessor, Hu Jintao.

In more detail, “Chinese authorities,” as Cheng Li highlights [94], “believe that they have now gained sufficient political capital as a result of their recent successes in public health, poverty elimination, green development, technological advancement, and military modernization.” This has created more self-assurance both domestically and internationally. However, the Chinese government must deal with major leadership changes during the 20th National Congress of the Chinese Communist Party in 2022 [109]. The abolishment of the presidential term limit and that the leadership selection of the 20th Central Committee (see Fig. 5.1) is not based solely on age has created a power vacuum and made succession less predictable. The Chinese leadership needs to reconcile between “political stability and drastic moves” related to domestic and foreign political challenges [94]. In addition to the existing structural challenges, under President Xi, China’s unemployment rate and economic cost have risen sharply due to the government’s strict measures to control Covid-19. To prevent further market concentration and prevent unfair practices, China’s most innovative and profitable technology firms in the digital economy have been constrained under the policy “Operation Cyber Sword” [46], which has created uncertainties and significantly lowered investments and trust in China’s market. The government must also deal with the fallout of the Evergrande real-estate crisis and prevent negative ripple effects and spillovers that would be reminiscent of the Lehman crisis in 2008. In foreign policy, China has become more assertive to protect its growing overseas

assets and respond more vigorously against U.S. coercion. The West has construed China's assertiveness as "wolf warrior" diplomacy and as a departure from Deng Xiaoping's foreign policy dictum of "hide your strength, bide your time". Of course, a more silent China, that remains submissive to the West, is preferable than one that breaks through previous hierarchies and dependencies. Under President Xi, legitimacy has become a more important issue due to the fading meaning of the communist revolution and less rapid wealth generation for the Chinese people. While Chairman Mao focused on "survival" and Deng Xiaoping on "development," Xi Jinping wants China to become "strong" and restore its "dignity", which was lost during the "century of humiliation" and civil war. For Xi, China must retain its mission and stay cautious to avoid becoming an appendage of the West yet again. However, China's new gradualism bears the risk that the country could further isolate itself internationally and fail to drive the formation of a new global order. This risk has increased tremendously since Russia's war in Ukraine. While China needs Russia as a partner to counterbalance the United States, China seeks to not anger the U.S. further and risk more severe sanctions. Conversely, the U.S. will most likely use the Ukraine crisis not only to weaken Russia, but also to exert more pressure on China and further seek to isolate it.

Equivalently, the West is experiencing its own crisis as well as a renaissance of state intervention and industrial and welfare policies that respond and deal with global challenges. This clearly suggests that the previous phase of capitalist globalization has reached its limits and is unsustainable in its current form. The EU's regular budget coupled with the temporary Next Generation EU instrument add up to the largest stimulus package ever financed in Europe. Likewise, the "Build Back Better" bill of the Biden administration is the largest U.S. expansion program in 60 years. There is a clear reversal of Ronald Reagan's famous dictum that "government is not the solution to the problem; government is the problem." On the contrary, there is a political majority in the West that promotes more intervention and stimulus as the solution, not the problem, yet the similarities between the West and China create new silos and perpetuate the crisis in global governance. Without doubt, for many people capitalism is no longer the "shy deer" of the past liberalization period, which had led to unparalleled growth and development. Today, there are more radical voices envisioning a "post-growth era" as a remedy for the many ills of capitalism. Such a vision remains a utopian one in the West, because it would severely compromise competitiveness. It is a dystopian one for the Global South as well, because it disregards the ongoing need for catching up and alignment with the Western standard of living. However, the West's push towards decreasing dependencies on its perceived adversaries like China and Russia, and mitigating supply chain risks, which became most visible during Covid-19 and the Ukraine crisis, signaled "a departure from the globalization of recent decades, when businesses bought and made products where costs were low and free-trade policies made moving goods around the world cheaper and faster" [97]. We have certainly reached the limits of both liberal capitalism and hyper-globalization. The previous system of globalization, which was invented by the West, no longer functions for the West. Such a deadlock requires further unpacking of its underlying causes and is addressed in the following section.

5.3 No End of History in Sight

To recall Fukuyama's famous "End of History" [113], which meant that liberal democratic capitalism was here to stay after the Fall of the Berlin Wall in 1989, sought to repair and optimize itself, and would eventually assimilate other non-democratic, authoritarian countries. In other words, Fukuyama's thesis suggested that the West was able to predict or determine history, and that there were no other external forces that could have influenced the cause of history. Obviously, the "End of History" did not last and was opposed by the Western political Left from the outset. Neither the welfare state of the 1990s nor the push towards post-Keynesian policies in the early twenty-first century helped to avoid the steady rise of income and wealth inequality in the West or globally. Climate action was not yet part of that history or the mainstream political agenda. Capitalism turned into hyper-globalization, causing a series of shocks that started eroding all the cornerstones of Bretton Woods. The economic crisis in 2008, the largest recession since the Great Depression accompanied by a prolonged financial and fiscal crisis, was not an exception but an unavoidable outcome of this process of wealth concentration since the 1970s. According to the French economist Thomas Piketty [114], the rate of return on capital has remained higher than the growth rate of an economy during this time. As a consequence, "inherited wealth" has grown faster than "earned wealth", which has caused a higher concentration of wealth and therefore greater wealth and income inequality. The global pandemic, which broke out at the end of 2019, is a health crisis, but has also revealed the inequality and disruptions of capitalism. The war in Ukraine has caused a humanitarian crisis but has also revealed capitalism's thirst for scarce natural resources and fossil-fuels as well as the fragility of global supply chains. Thus, "history did not end," because China has not become a liberal democracy and therefore poses a threat towards the West, but because liberal democracy has failed to repair itself and optimize capitalism for the benefit of the people but has left the world in dire straits.

The political Left in the West opposed Fukuyama's "End of History" as an apocalyptic sentiment. It just equated to "more market" and "less state," or better still, "more state" whose powers (judicative, legislative and executive) became the safeguards of self-interest and return on equity. In a Marxist sense, both state and market formed an alliance, while the latter set the terms of the relationship. As previously mentioned, past decades have undermined a fair distribution of wealth and social cohesion and solidarity—the cornerstones of social democracies, which today are relegated to the margins of the political spectrum in Europe. The Marxist, Göran Therborn, has critically judged Giddens' Third Way as "short-lived" [19: 100], a worthwhile attempt that nevertheless failed. For Slavoj Žižek, "the Thatcher revolution was in itself chaotic, marked by unpredictable contingencies, and it was only the Third Way Blairite government that was able to *institutionalize* it, to stabilize it into new institutional forms [...] Blair repeated Thatcherism, elevating it into a concept" [115: 189]. Europe's "third ways" did not provide an alternative, but merely signaled "capitalism's ideological triumph". "The victory [...] occurs", in Žižek's dialectical

reading of history, “when the enemy talks your language” (ibid: 189). In other words, the “third way” completed what neoliberal politics of the 1980s had started.

A disturbing outcome of the years of global capitalist development in the West has been the rise of populism. Income inequality and stagnation, unemployment, insecure employment, heightened risk of poverty and social exclusion are the main sources for the rise of the West’s populist wave. People have developed a general distrust in established political parties and figures and blame them for not addressing their concerns about the perceived losses of security, culture, and identity. Globalization, liberalization, and the digital transformation weakened the nation state and have slowly undermined the capacity of governments to address these disruptions. According to Dani Rodrik’s [116] “inescapable trilemma of the world economy” (see Fig. 5.2), local governments had compromised democratic policies for the “golden straitjacket” of hyper-globalization, which demanded relentless liberalization of markets [for further assessment, cf. 117, 118]. As discussed above, the return of sovereignty has been the response to the disruptions of hyper-globalization, the failure of multilateralism, and thus, the seemingly inescapable crisis in global governance and problem solving.

While established political parties were entangled in identity politics and the struggle on marginal limits, charismatic populist leaders increasingly capitalized on the people’s rage throughout Europe and America. Populism now continuously poses one of the greatest threats for liberal democracy. It is “a symptom of democracy’s deeper crisis” [119]. As David Runciman [120] highlights, populists address the correct struggles and fears but provide false answers, promising a quick recovery of an allegedly intact and culturally homogenous past. Their rhetoric polarizes society and further drives fear, which fuels, rather than helps, to overcome the public’s rage. What makes populism so dangerous is that it does not question, but slowly erodes the very institutions of democracy, such as free elections, free press, or the rule of law. Equally dangerous is that the liberal population continues to believe in the very

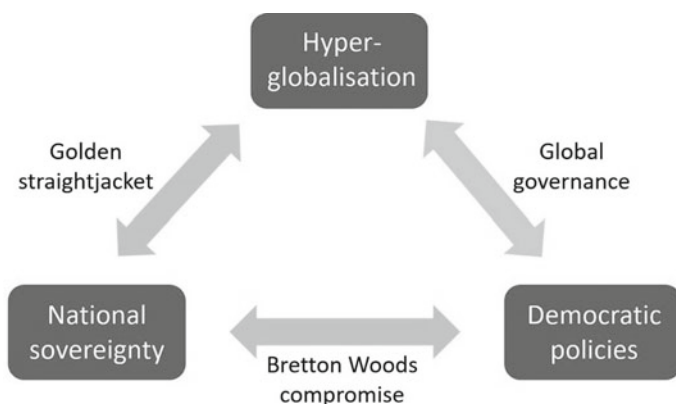


Fig. 5.2 Dani Rodrik’s globalization paradox. *Note* Adopted from *The demolition of Rodrik’s trilemma* by A. Ortega, 2018, The Elcano Royal Institute

functioning of democracy, even though they know it has already ceased to effectively do so. Populism is not its own cause but the result of an already broken process of equal wealth creation and dignity, which is perpetuated by populists in the West. While identity politics are essential part of liberal democracy and the emancipation of marginalized groups in the West, it has also spawned populism, undermined governance efficiency and the formation of political majorities that could carry out necessary reforms. It is no longer a matter of political left or right. The center parties are in decline and more radical parties have gained significant ground. Although Emmanuel Macron won his second presidential term in April 2022, the French far right leader, Marine Le Pen, achieved her best result with 42% of the vote. Another negative trend is a steadily decreasing voter turnout. The French 2022 elections saw the lowest turnout in more than 50 years. This is a critical issue, to paraphrase Rodrik [121], good governance is the condition for strengthening democratic principles and institutions.

Such a staggering conclusion is not new. It had already been reached in “The Crisis of Democracy: On the Governability of Democracies,” a report written by Michel Crozier, Samuel Huntington, and Joji Watanuki [122] for the Trilateral Commission in 1975. Analyzing the democracies of the U.S., Japan, and Europe, the authors concluded that “[d]emocratic government does not necessarily function in a self-sustaining or self-correcting equilibrium fashion [...] There is a deeper reason for pessimism if the threats to democracy arise ineluctably from the inherent workings of the democratic process itself.” For the authors, the central dilemma of all major democracies at that time were “the demands on democratic government [grew], while the capacity of democratic government stagnate[d] (9). It was the “increasing complexity of social order, increasing political pressures on government, and decreasing legitimacy of government” that caused such inner stagnation and which “undermined the governability of democracy” and the “needs for longer-term and more broadly formulated purposes and priorities, for a greater overall coherence of policy” [122: 8–9].

Today, Western governments are even less able to define and execute coherent policies that abandon its dated hyper-capitalist model and promoting instead a new emancipatory egalitarian and sustainable agenda. Many young people in America and Europe express their dissatisfaction with neoliberalism and even demand more of “socialism” that strives to achieve a balance between individual rights and individual responsibilities. It has become less a question of the old political left or right, but more a question of pro or anti-globalization. The demand for deglobalization has been on the rise and coincides with the crisis in global governance. However, during the 30-year anniversary of the Fall of the Berlin Wall in 1989, and still prior to the global pandemic, Fukuyama said that Western liberal democracy was still the only viable political system in the world. Neither the Arab world, Islam, the African continent, nor Russia provided a viable alternative that ensured prosperity, dignity, and public participation in the political process. Yet, Fukuyama [123] stated that China was the only alternative. Concurrently, he was skeptical about China’s long-term ability as the country experienced its first economic crisis and recession, which could fundamentally undermine the legitimacy of China’s party state apparatus. To

Fukuyama, the rule of law and abstract state institutions as well as elections are the procedural means in the West to regain public and popular legitimacy. Ultimately, such a risk applies to the West as well, considering its own legitimacy crisis. Berthold Brecht's famous words summarize such old wisdom: "First food, then morals" ("Erst kommt das Fressen, dann kommt die Moral").

In 2020, Fukuyama [123] proposed another way to compare the performance of governments in addressing the global pandemic and other potential future shocks [123]. He does not question Western democratic institutions and processes, but looks at the level of state capacity, social trust, and leadership to explain the effectiveness of prevention and recovery measures and make sense of China's relative success. "Countries with dysfunctional states, polarized societies, or poor leadership have done badly, leaving their citizens and economies exposed and vulnerable." This helps to explain why the Trump administration failed miserably in fighting the pandemic regardless of China's initial delays and lack of transparency, and why China performed exceptionally well. Not knowing whether President Biden would be elected, Fukuyama further concluded that countries "doing well on all three fronts would come through the crisis relatively well and implement reforms that make them stronger and more resilient." In this way and at least in relative terms, China can be confident in its governance approach and the durable solidarity of the Chinese people. Based on Fukuyama's categories, it is questionable as to whether President Biden can resolve the damage of the Trump administration. The problems are more structural than singularly based on the leadership of a president. At this stage, U.S. democracy, which is facing its post-Biden era from 2024 and could well lead to the re-election of Donald Trump, cannot provide much certainty about the future.

5.4 The Limits of the United States

As the economist Nouriel Roubini [124] has argued, the neoliberal agenda of previous presidents, Bill Clinton and Barack Obama, supported the emergence of an oligopolistic economy that exacerbated inequality. This both bred and was interrupted by Trump's neopopulism, which has now more clearly manifested under Biden's presidency. Unlike many democrats' initial belief that President Biden would somehow return to the neoliberal politics of the Obama administration, the Biden administration follows Trump's nationalist and protectionist trade policies as well as his controversial immigration policy. The debt-trap based economic model of the U.S., which is unlikely to experience any significant change under the Biden administration, makes the U.S. more vulnerable to external shocks and doesn't leave space for a change in foreign policy behavior. The U.S. government, especially the previous Trump administration, blamed China for the country's immense trade deficit, and thus, for the loss of the manufacturing industry and millions of jobs, to justify the unilateral trade war against China. However, running a trade deficit has been part of the U.S. growth strategy. Since 1975, the United States has maintained a trade deficit with almost all of its trade partners. Over the past four decades, the United

States has imported more products than it has exported. During the same period, on average, the United States also maintained a current account deficit, which means that the country had to borrow foreign capital to finance its imports. China has accumulated U.S. Treasury securities over the last few decades. As of October 2021, China owned more than US \$1 trillion, or more than 3% of the US \$28.9 trillion U.S. national debt, which is more than any other foreign country except Japan. There should be no doubt that such overconsumption and overspending have made the United States the primary engine of global growth as well as the most attractive country for foreign investors. Once globalization picked up in the 1990s and 2000s, this resulted in tremendous wealth and vastly increased living standards, not only in the United States, but also in many other parts of the world, including Europe and China.

Looking to Asia, before the United States began running an increasingly large trade deficit with China, it already ran a large trade deficit with Japan and then with the Four Asian Tigers: Hong Kong, Singapore, South Korea and Taiwan. From the 1960s to the 1990s, the Asian Tigers, like Japan before them, underwent rapid industrialization and maintained high growth rates, eventually becoming high-income developed economies. However, since China's reform and opening in 1978, the U.S. has also taken over the Asian Dragons' trade surpluses, and has steadily increased imports from China, especially during the 1990s and the beginning of the 2000s, when China's economy grew most rapidly.

In the past, trade deficits were not an issue for the United States as long as the country maintained its comparative advantage and competitiveness. The division of labor based on comparative advantages has been a cornerstone of modern industrialization and the underlying structure of international trade. In the capitalist pursuit of maximizing profits while minimizing costs, the United States outsourced manufacturing and assembly to countries with cheap labor forces and less restrictive labor and environmental regulations. Obviously, China and other late emerging economies became preferred outsourcing destinations for the United States and Western Europe, which instead focused on research, innovation, and high-margin service sector growth. A key indicator that the United States has followed this strategy relentlessly is its import of intermediate or half-finished goods, which are domestically assembled into finished goods. Such goods make up 60% of U.S. imports and are mainly comprised of electronics, transportation, and machinery parts. Although the import of such parts contracted by 52% during the 2008 financial crisis, after the crisis, imports doubled again, highlighting that outsourcing continued unabated, as did much of the country's overspending and overconsumption.

5.5 China Can Still Catch up but Remains on Collision Course with the United States

The US and Europe largely accepted China's catch-up strategy over past decades as long as the West could sustain its comparative advantage over China. In 2010, however, China became the second largest economy overtaking Japan and further moved up the value-added chain with historically unparalleled speed. Although China largely remains and faces the challenges of a late emerging economy, it is no longer simply the cheap-labor cost assembly center of the Western world, but now directly competes against the United States and Europe in high-technology areas such as 5G and 6G mobile communications technologies and artificial intelligence as well as IOT, robotics, quantum computing, and biosynthetics. China is increasingly becoming an innovation-driven economy, which used to be the prerogative and sole achievement of the West. The country is on the way to become the largest economy by 2035 but faces a rapidly aging society, thus a shrinking labour force and risks transitioning to a high-income economy due to rising costs and potentially declining competitiveness. In spite of an uncertain global context and severe domestic challenges, Bert Hofman [125] argues that China can still manage to align economically with the U.S. in the next two decades. While real exchange rate appreciation, together with comprehensive reforms (including boosting the private sector and achieving higher capital allocation efficiency) would help to accelerate catch-up, failing to do so and/or a debt crisis could prevent China from achieving its 2035 mid-point centennial development goal—to narrow further the wealth gap with the West and achieve “socialist modernization.” There are tough U.S. restrictions on foreign direct investments, export of emerging technologies, and research collaboration imposed by several acts and executive orders, including the 2018 Foreign Investment Risk Review Modernization Act, the 2019 Executive Order on Information and Communications Technology and Services, and especially the 2018 Export Control Reform Act (together with the Entity List), which directly target and seek to contain China's development. Several additional acts and policy recommendations were released under the Biden administration (see Fig. 3.4). While China is clearly hurt by those restrictions, it has provoked tremendous spending in research and development to achieve self-reliance in critical technology areas. China has also demonstrated in the past that it could achieve growth and increase productivity based on legacy technology.

For the U.S., growth acceleration could also delay or even prevent China from aligning with it. However, the U.S. is increasingly losing its relative competitiveness and power against China. Consequently, the U.S. government will continue boosting its competitiveness and following a China targeted interventionist strategy, which is publicly justified as based on protecting human rights and the rules-based order, ensuring fair competition and preventing IP theft or forced IP transfer. In turn, China has no choice other than to protect its own interests domestically and internationally and relentlessly focus on sustained development and growth as well as on technology innovation to escape its middle-income trap. China still has a long march to achieve its 2049 centennial goal and become a “fully developed and advanced nation” and

a “leading global power” with the Chinese people enjoying “common property.” Despite its economic and technological might, China’s per capita GDP might still only be 50% of that of the U.S. by 2050. Thus, China needs to continue its reforms and opening of markets, however the government has little choice other than to continue following its gradual reform path based on a strong state, selective market intervention and protectionism.

Deep-seated interests, mutual fear, and Western arrogance are among the key factors that have obstructed mutual understanding and further deteriorated Sino-U.S. and Sino-Europe relations. China’s current strategy is perceived as protectionist and assertive, breaking with the previous strategy of “hiding her strength” and “biding her time.” In addition to such mutual fear, fierce competition and competitiveness offer little space for collaboration, especially since China is increasingly becoming an innovation-driven economy, which used to be the prerogative and sole achievement of the West. While non-Western countries and especially China’s neighbors and the ASEAN countries do not wish to take sides, the relationship between Europe and China has come to a hold. Against this backdrop, there is no consensus between United States and China in sight, only unavoidable conflict. While the U.S. would need to come to terms with its relative decline and depart from its doctrine of exceptionalism, China would need a departure from its unique characteristics, open up faster, and provide a transparent and rules-based development platform for its Belt and Road Initiative. Such convergence seems impossible for now. The Chinese government needs to control the economy and society to keep stability and reach its development goals. However, China’s continuous requirement for a strong party-state apparatus and the concept of “benevolent real politics,” clashes with the principles of liberal democracy and the open societies of the West. Conversely, it is the responsibility of the Western world to reform the current global order, which has largely failed to integrate non-Western and late emerging economies more equally. It needs to consider more seriously that the Global South will not readily or willingly transform into a global community of modern liberal democracies. Before criticizing others, the West must reform itself to demonstrate once again that liberal democracy can deliver and maintain the highest standard of living and human dignity more equally.

For now, the games played are different than before and appear endless. It now appears that the United States and China are bound to usher in a new “Cuban Missile Crisis” with Taiwan dangerously pushed into the role of “Cuba” but off the south-east coast of the Asian continent. Western media and politicians are more intensely contemplating whether China will invade Taiwan in the face of Russia’s invasion of Ukraine [126]. However, it seems rather unlikely that China would do so for at least three reasons. First, China relies heavily on Taiwan’s chip industry to power its own development and reach its half-centenary goal. China wants to double its GDP by 2035, further narrow the wealth gap, reach its climate targets, and be a top ranked innovative nation, including becoming the world leader in AI and 6G mobile communications. To achieve these goals, China needs access to Taiwan’s semiconductors, which powers the transition towards the AI-driven digital economy. Taiwan accounts for 92% (South Korea 8%) of all the world’s most advanced semiconductor production capacity and is selling a significant amount of mid-level chips to Mainland China. In

2021, revenue from mainland China for TSMC, which is Taiwan's largest producer of semiconductors, accounted for nearly US \$5.62 billion. A potential war between China and Taiwan would devastate the chip industry, derail China's development, and severely disrupt global supply chains and the world economy. According to the Boston Consulting Group [127], a one-year disruption to the Taiwanese chip supply would globally cause a US \$490 billion drop in revenue for technology firms (40–41). This also explains why many U.S. technology firms are “cooperationists” according to Jon Bateman's classification of the three camps, which have taken different positions towards the US-China relationship as outlined above. For China, this is not a risk that the government is willing to take. Growing the economy and improving the prosperity of Chinese citizens has been the top priority of the Chinese government. Second, it is irresponsible to think that China would simply follow Russia's aggression, and that Taiwan might become the next Ukraine. China has a proven track-record of taking approaches that differ to Russia in how it handles foreign and geostrategic affairs. While Russian armed forces have completed multiple combat missions overseas in the past, including in Georgia, Moldova, Syria, Kazakhstan, and most recently Ukraine, China has only been involved in border disputes with India, but has refrained from military interventions in other countries. China's last invasion took place in northern Vietnam more than four decades ago. China's largest overseas deployment of troops has been for United Nations' peacekeeping missions. Whereas Russia operates 24 military bases around the world, China only operates one, in Djibouti, and has the potential to establish a second in the Solomon Islands. The Djibouti military base was established to protect against the threat of maritime piracy on transport in the troubled waters off the coast of Africa. By comparison, the United States operates around 750 military bases in 70 countries around the globe. While the Russian president has taken an aggressive posture towards the Western world, the Chinese president has demonstrated China's prolonged peacefulness and invested much time to showcase China's willingness to work with all countries around the world in the pursuit of “win-win” relationships and of creating a “community with a shared future for mankind.” This vision manifests in the core principles of China's Belt and Road Initiative and is reflected in China's commitment to fight climate change. Third, the United Nations does not recognize Taiwan as a sovereign country but as part of China, whereas every nation recognizes Ukraine as a sovereign nation. Yet, President Putin is not satisfied with Ukraine being a sovereign nation. In his mind, Ukraine is a part of Russia, and its people are ethnically Russian. In 2021, China celebrated its 30-year anniversary of diplomatic relations with Ukraine. Since 1972, however, the United Nations has officially recognized that there is only “One” China, and that Taiwan is part of it. The “One-China” policy is widely respected and only a few micro-states maintain direct diplomatic relations with Taiwan.

Those three points suggest that Taiwan will not become the next Ukraine. China has no interest in an invasion of Taiwan. The status quo will continue for the foreseeable future if the Taiwan question remains a “frozen conflict.” However, the biggest threat towards an invasion of Taiwan and the peace in the entire Asia-Pacific region is an American Intervention and further militarization of the region. For the U.S., the biggest crisis is not the war in the Ukraine, but China's rise. Hence, the only

scenario that could lead to war is if the U.S. located naval ships around the island and asked the Taiwanese government to formally declare independence. If this were to happen, Mainland China would be obliged to defend its sovereign territory leading to war. For now, the Taiwan Relations Act of 1979 defines the U.S. commitment to defend Taiwan from a Chinese invasion; but over past decades the U.S. has practiced a policy of “strategic ambiguity,” which has made it unclear whether it would surely defend Taiwan or refrain from doing so. However, President Biden has been the first president to intentionally or unintentionally contradict that policy by stressing the U.S. commitment towards Taiwan [128]. While the U.S. sticks to the “One China” policy, Biden’s confusing remarks, together with his administration’s whole-of-government containment approach towards China (see Fig. 3.4), leaves too much uncertainty. Smart diplomacy is urgently needed to prevent the worst from happening.

Chapter 6

Recommendations for Policymakers



To better understand today's crisis in global governance and the rise of technonationalism, this extended policy brief set out to revisit the history of telecommunications. After telecommunication's transformation from chaotic emergence (1850s–1900s) into a long period of regulated monopolies (1913–1970s) and its liberal transformation (1980–1990s), that resulted in unprecedented innovation and economic growth and ushered an era of unprecedented global innovation, it created a value ecosystem for telecommunications and Internet technology. However, this era was short-lived, because it led to tremendous contradictions and today's crisis in global governance along with a return of territorial and digital sovereignty, and a regression towards technological and ideological silos. The rivalry between the West and China epitomizes this crisis. Against this backdrop, public and corporate policymakers are confronted with a tectonic shift, which is driven by climate change and the rapid advancement and adoption of AI. This final section summarizes some of the key insights from the past, which are deemed relevant for the understanding of today's transformation towards a digital, intelligently automated, and sustainable economy. This final section also makes a set of recommendations concerning global governance in relation to today's return of sovereignty and the crisis in multilateralism and multistakeholderism.

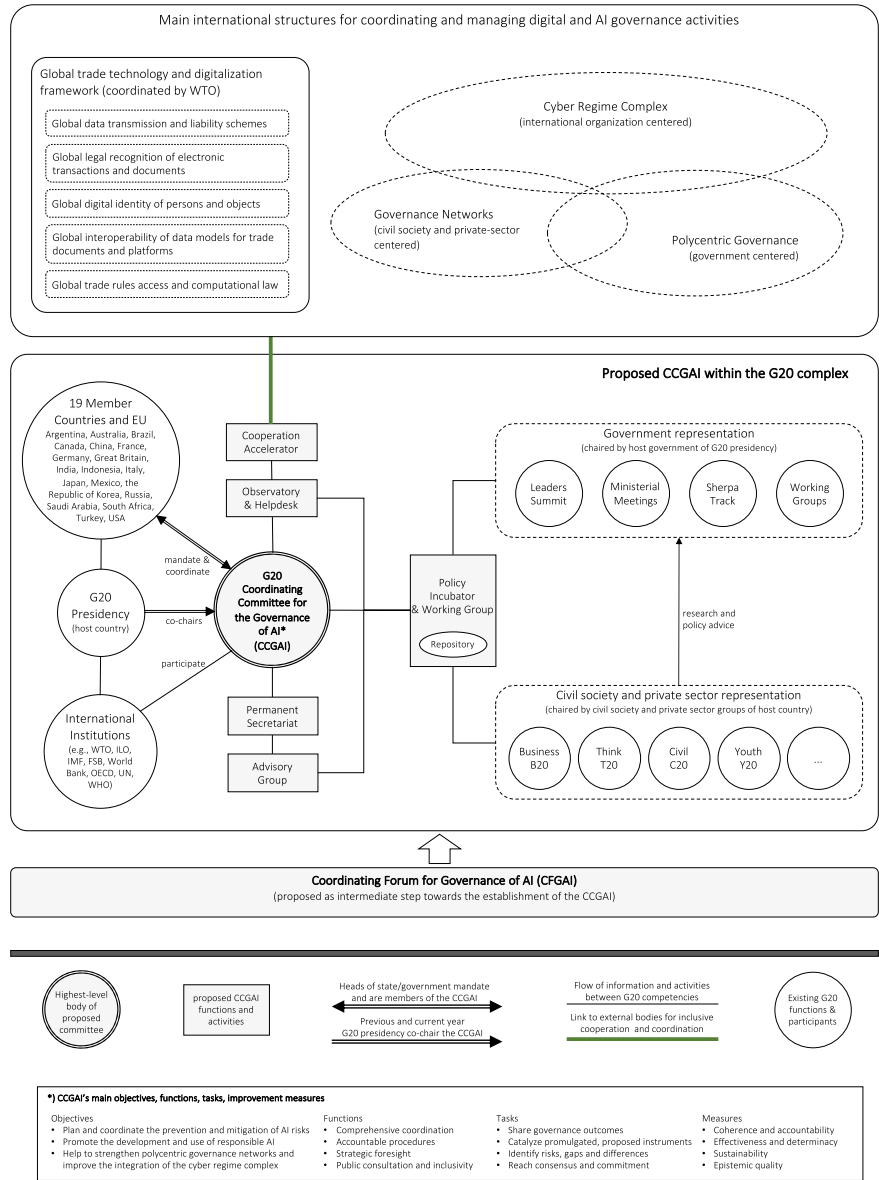
1. Both the developed and less developed worlds have benefitted from the transformation of the telecommunications industry. Yet, the West has gained most from these previous transformations keeping its advantage through domination and coercion, as well as control over technology standards, adoption, spillovers, and its multinational corporations governing global supply chains. Such a prolonged asymmetrical distribution of power during the past century largely suppressed the less developed world in the acquisition of knowledge required for developing a native technology industry.
2. Amongst the late emerging economies, China has been the only exception and has successfully managed to become the global leader in mobile communications. China needed to imitate what the West had practiced before and during each

industry transformation. Convergence with Western technologies and its standard of living is not accomplished based on market dynamics alone; thus, the Chinese government did not retreat but continued as a strong state and intervened to enable its telecommunications sector to catch up to the West. The government set up a national R&D program, imported Western technologies and allowed foreign investments, and gradually introduced a market for equipment manufacturers. In the meantime, China secured its position in multilateral and multi-stakeholder institutions, which successfully led to a break with the post-colonial and post-Cold War power structure. China progressed from being a source of cheap labour and manufacturing and over developing huge domestic markets for Western products, to become an increasingly innovation-driven and world's second-largest economy. Thus, as China transitioned into a modern economy without the adoption of the Western political-cultural system, its rise also became the core of rivalry between itself and the West.

3. Technology changes the nature of opportunities and distribution of power but does not determine the course of history. The Internet was neither intrinsically linked with a certain ideology, nor did its decentralized architecture automatically ensure an open and free cyberspace. Rather, past transformations were largely driven by new incentives and choices made possible due to the rise of Internet technology, the proliferation and global enforcement of liberal politics, the corporate demand for further market liberalization and its exploitation of regulatory loopholes. Due to this combination of forces, the Internet revolutionized mobile communications and made it the fastest adopted technology of all time, impacting all major industries and society. Conversely, the Internet has become a negative symbol of the big technology firms attention and surveillance platforms, heightened cybersecurity and privacy data threats, and generated a fragmented cyberspace regime that mirrors the geopolitical power struggle between the U.S. and China. While the goal of digitalization is primarily to build a secure, trustworthy, and fair digital economy, its enabling technologies, especially 5G, 6G and AI, have become extremely politicized and the target of geopolitical and geostrategic rivalry.
4. Like the Internet before it, AI is the key driver of this century's transformation, but the direction of human history remains unclear. As a tremendous new source of efficiency, political systems can take advantage of AI for its benefits and alter the existing distribution of power. Although the Internet has disrupted entire industries and society at large, it was not seen as a long-term threat. The advent of AI however was beset by regulators that emphasized the disproportionately negative impact of AI across all human domains. Thus, AI began facing a risk-based regulatory approach, most notably in Europe, China, and increasingly, the United States. However, the modern overreliance on technology causes an AI governance gap. In this view, both technocracy and the governance gap inevitably lead to widespread diffusion of AI and the risk that AI adoption would primarily reinforce existing inequalities and tensions. Likewise, although AI has

the potential to contribute to decarbonization, technocratism has already determined climate policy, which has merely led to incremental regulation changes; thus, political will is needed to achieve desperately needed change.

5. Both AI and climate change are global issues with seemingly insurmountable governance gaps. Therefore, the essential task is to counterbalance the strong demand for national and regional sovereignty with global governance and robust domestic institutions and economies. To bypass the crisis in multilateralism and multistakeholderism, governments have resorted to territorial and digital sovereignty and engaged in bilateral and plurilateral negotiations, while private actors have joined new multistakeholder institutions. Those smaller groups of countries are more likely to reach joint agreements than succeed in multilateral negotiations; thus, causing further division and fragmentation of the global political system and global innovation ecosystem. As groupings remain influential or gain strength, and new groupings emerge, it is crucial to establish links between such groupings and facilitate dialogue. Widespread adaptation of AI is occurring due to its vast efficiency and strategic potential and the deeply rooted belief in techno-science as a solution to human problems. Therefore, as outlined in Fig. 6.1, this extended policy brief proposes the implementation of a “global coordinating committee for the governance of artificial intelligence” (GCCGAI) to plan and coordinate the effective prevention and mitigation of AI risks long before they become emergencies [63]. A GCCGAI should identify and promote AI governance and technology solutions that serve social good and rapid decarbonization. This brief also proposes the Group of Twenty (G20) as the obvious institution for a CCGAI, given the group’s broad representation of economic activity, its considerable influence on international policy coordination and framework design and, its and loose diplomatic linkages between competing economic blocs and rival political systems. Collaboration links should foremost be established with the G20 Developing Nations (G20 +) as well as the Association of Southeast Asian Nations (ASEAN) and the African Union. Like the European Union, the African Union should become, as proposed by U.S. President Biden, a G20 member to ensure inclusivity [129, 130]. The CCGAI should also establish a link to the WTO’s “5 Gs of TradeTech” proposing a global trade technology and digitalization framework [131]. Such a commonly agreed framework would include global data transmission and liability schemes; global legal recognition of electronic transactions and documents; global digital identity of persons and objects; global interoperability of data models for trade documents and platforms; as well as global trade rules access and computational law. Overall, increased central coordination on a global level does not oppose local or regional approaches, which manifest as polycentric governance and governance networks. To become more effective central coordination should prevent further fragmentation of the global cyber regime complex and provide more certainty for bottom up, democratic approaches.
6. Given that different cultural values and political systems, histories, and stages of development continue to push divergent views, a more flexible and nuanced



approach to global coordination and collaboration is needed. To avoid further conflict, new jointly agreed rules are needed. The reform of the global political system must be open to ambiguity, embrace special and differential treatment of countries, and attempt to solve problems through a more flexible, case-by-case approach. It demands reforming the rules of collaboration and coordination to achieve a balance between diverging interests and preference points, and to facilitate bargaining. This includes building consensus on a system of monitoring and sanctioning that identifies violations and ensures transparency and compliance. In addition, governance centrality, that involves all major and rising powers on a global level, is essential. It must support and complement an emerging structure of polycentric governance and decentralized governance networks. Such flexible centrality must be based on multilateralism, which provides the only possible way to counter concentrations of power and an environment for bargaining and redistribution. Successful reform of the global political system would result in a new global innovation and value ecosystem, such as that which enabled tremendous growth and development in the past. This time however, it must focus on global problem-solving, while preventing closure of meaningful channels of dialogue and action between the US and China, as well as between Europe and China.

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