

# TECHNOLOGY AND GEOECONOMICS: EMERGING CONFLICTS IN THE DIGITAL WORLD

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## ABSTRACT

Environmental analysis is a key area of strategic Marketing. The new global environment is changing their nature during the last decades, emerging new concepts such as the digital revolution and the geoeconomics' challenges. The nature of international conflicts is changing, shifting from the diplomatic and military arena to the technological and economic one. Nowadays, telecommunications warfare is standing up strong as the protagonist of the current scenario. Superpowers are competing on who will be playing that role on the international scene. The fifth generation of telecommunications (5G) is pushing China and USA in a geoeconomics conflict. Both countries are fighting to set up their best strategies of propagating their geoeconomic influence and attaining their strategic goals, preserving their digital sovereignty from any kind of abuse and violation.

This paper focuses on the geoeconomic characteristics of the 5G warfare, sheds lights on its manifestations in the recent emerging events on the international scene, explains the way in which China and USA are dealing with it through displaying methods of cyber-diplomacy implemented by these powers to achieve their aims, and illustrates the repercussions of that techno-war at the politico-economic level, and most importantly at the level of individuals' health and their immune system.

## INTRODUCTION

A non-armed war, is occurring nowadays all over the planet: which country will be the leader of the 5G innovation in the internet and telecommunication technology? A Napoleonic remark uttered more than 200 years ago stated: *"Let China Sleep, for when she wakes, she will shake up the world"*, and it seems that 5G has waken China up, and the world started to shake.

Indeed, the world is living now in a transitional phase, and preparing itself to move from the 4G to the 5G stage... And following is a brief of the past stages from 1G to 4G, which have paved the path to their successor: 5G.

The first generation of mobile telecommunications, 1G allowed us to make wireless phone calls; 2G was the tech that enabled texting options; 3G brought web browsing; and 4G made the video-streaming come true, and insured a constant connection with GPS satellites, which has permitted the rise of many companies like Uber (Bremmer, 2019).

The current phase we are living in, is the transitional one, for we are shifting from 4G to 5G, which will be totally different than the previous upgrades known at the telecommunications and technology levels. And here comes the chaos, USA is against the Chinese integration in their infrastructures and network through – the largest provider of telecom equipment in the world – Huawei's equipment and hardware. Main arguments are:

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- For fear of China's spying the American companies' database because they will be streamed through their own hardware;
- Using Huawei equipment could leave the US susceptible to China's infrastructure attack, if they ever went into war (Bremmer, 2019).

Thus, the American administration spread political and economic tension between its European allies, to limit Huawei's participation in building 5G networks, to remove all its equipment from their markets, and to end up all the agreements done between their companies and mobile network providers from a side, and Huawei's company from the other.

Does this 5G constitute a real threat to the cyber sovereignty of the USA? And is it really capable of spying and executing cyber attacks against its database, and violates its security? It is true that as technology evolves and progresses, the information and evidence become more susceptible to abuse, but is that the main goal behind this emerging war between China and USA? Breaching each other's cyber sovereignty?

In the 2020 Annual Report to Congress *of the U.S. – China ESRC*, it was clearly stated, in the key findings, that China is consistently working on a new model and standards for the global order: "The Chinese Communist Party (CCP) seeks to revise the international order to be more amenable to its own interests and authoritarian governance system. It desires for other countries not only to acquiesce to its prerogatives but also to acknowledge what it perceives as China's rightful place at the top of a new hierarchical world order" (U.S. – China ESRC, 2020, p. 80).

Furthermore "The Chinese government views technical standards as a policy tool to advance its economic and geopolitical interests" (U.S. – China ESRC, 2020, p. 81).

After all, it seems that 5G is the new bait, to attract and catch the global market, and Huawei is the most competitor bait-maker. But is this lure going to catch only good preys of the market? What about dangerous ones? What if it fails to achieve its target? What if it backfired and gets opposite impacts to the ones China and Huawei initially intended?

Many questions and queries are treated in this study and are waiting to be explored.

### **METHODOLOGY**

This paper addresses the 5G from two main perspectives: the politico-economic and the technological. In order to treat this subject and answer all its questions, we are going to analyze secondary data by adopting the narrative and analytical methodologies. Therefore, data is collected from books, academic journals, and newspapers, in addition to readings from global and valuable economic, political, health, and most importantly technological think tanks.

### **GEOECONOMIC CHARACTERISTICS OF THE 5G WARFARE**

The global economy has been largely devastated by the telecom industry since its beginning. But recently, the new emerging 5G warfare has reached into every corner of it, to the point it started controlling the global economic growth, and ipso-facto became similar to the geoeconomic approaches shaping it.

This warfare, new of its kind as already mentioned, has so many similarities with the soft geoeconomic "trend" of wars recently replacing the military ones on the international scene. Therefore, in the following will be displayed some of the main geoeconomic characteristics of this 5G warfare:

### 1. The Soft Change

The so-often used concept of soft power, as coined by Joseph Nye in his article in *Foreign Policy* (Nye, 1990), usually refers to “a nation’s ability to co-opt rather than coerce, persuade rather than compel, to set agendas and to attract support”. According to him it is composed of three main pillars: a- the appeal of a state’s value, b- the legitimacy of its foreign policy, c- the attractiveness of its culture.

Herein, China and the USA are both applying their soft power “values”, in order to completely achieve and execute that change in terms of policies and technologies in the “softest” way it could happen on the international scene as battleground.

But due to that, 5G warfare is now called the 5G Cold Technology War, which reflects the fact of its non-military characteristics, turning out to geo-economics, especially in terms of politico-economic sanctions.

In addition, even the traditional term of soft power is subject to “digital” metamorphosis: it is no more based on political diplomacy, but on cyber – digital one, in the newly created digital sphere. Furthermore, this technological digital soft power is being individually shaped, rather than being exclusively controlled by governments and states.

This transformation is one of the main reasons behind the non-military battle between competitors, because it is relying on individual users, or mass-consumers all over the world.

### 2. The Fast Adoption, Spread and Expansion

One other main characteristic that distinguishes this warfare, is the fast adoption, spread and expansion of 5G; noting that this digital world is the new global commercial market and has its own economic compact internationally.

According to 5G Americas, “the fifth generation of wireless 5G, powered ahead at four times the speed of subscriber growth as 4G LTE”. (Nguyen, 2020) And due to the high effectiveness of 5G on increasing the working productivity, it is becoming extremely essential on our daily lives, starting from social interchange between friends and families, passing by the management of businesses and homes, without forgetting the financial transactions, and even attaining the level of personal healthcare management.

This new network is helping businessmen around the world in building their new strategies and re-configure their own businesses in the post Covid-19 period. In other words, these leaders do not have time to rebuild their damaged businesses and enterprises, therefore, they are recently relying on 5G possibilities, that are the fastest existing solution available for a more efficient and productive future.

Technically, 5G success key is its “faster speed, lower latency and ability to connect vastly higher numbers of devices than previous generations of mobile technology” (Chow, 2021, p. 3).

### 3. The “Peaceful” Competition (Not So Peaceful Though)

When policymakers of competitive countries around the globe come into adopting 5G and deploying its networks, they stood up facing critical challenges, requiring – or most accurately – obliging them to carefully consider a wide range of political, economic, technical, and strategic respects. Thus, this is shaping the existing race and competition in a more peaceful form, especially that as per McKinsey Global Institute: “Building a more connected world could create substantial economic value, mostly enabled by advanced connectivity” (MGI, 2020, p.13).

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Herein, each pole is seeking to create his own value based on 5G, and that has obliged them to invest all their efforts and time in increasing their own capabilities in this term, which has kept them out of the military fights and clashes.

And as its adoption and rollout is accelerating, the world started witnessing its impact on all terms, mainly politico-economic ones.

Moreover, and because 5G has the potential to enable not only economic growth but enhances the innovation of technologies at mostly all everyday lives' matters... Therefore, China and the US consider it as the key influencing factor of "the great power competition" (Jinghua, 2020).

What differentiates this competition, is that it is happening between companies of these great powers, and not their governments... This makes them "pawns of the geopolitical game" (Jinghua, 2020), which decreases the probability of hard battles, and military wars. Great companies are competing over their positions through their potentials and major capabilities... They undoubtedly are supported by their governments and might transmit data to them. However, it is not in the interest of any government nor its companies to enter into military conflicts due to this competition.

### **5G PROS AND CONS**

Many concerns have been raised due to the spread of 5G, some analyses value its advantages as outweighing its disadvantages, and others see the opposite. This is being a subject of high tension between the two main great competitors, China, and the USA. "Washington has raised concerns that sourcing 5G equipment from Huawei and other Chinese companies will expose a country to national security risks, such as espionage and surveillance. For its part, Beijing has dismissed these concerns as a flagrant attempt to politicize a technological issue" (Tirkey, 2020, p. 4).

This competition was one of the main reasons behind many rumors about 5G pros and cons; especially that the ban over Huawei "also appears to be closely motivated by the US stratagem to prevent China from gaining geopolitical, economic and technological clout by being the first mover of the technology. If Huawei emerges as a leader in 5G technology, China's gains are undeniable and perhaps even inevitable. Beijing may well replace Washington as a leading cyber power, shaping future technological norms for generations to come" (Tirkey, 2020, p. 7).

However, the table 1 will display the major Pros and Cons related to 5G and will be followed by a brief explanation accordingly.

The excitement of developers towards the 5G innovation is understandable to the last extent, but like any network innovation – related to data – many rumbles allege either advantages or disadvantages in terms of this new technology, especially that it was accompanied by the huge pandemic of Covid-19...

However, what will be displayed herein, does not mean that the paper confirms or deny neither the pros nor the cons related to 5G, because it is an extremely critical issue that can be seen from a different perspective. And as every aspect of international relations, 5G should be calibrated objectively. Thus, the paper shows here the fundamental benefits and drawbacks of this innovation as shown by recent studies from different points of view.

Table 1. 5G Pros and Cons.

5G PROS	5G CONS
Increases energy efficiency, eliminates emissions, reduces pollution	Affects health and environment due to exposure to very low-frequency electromagnetic fields
Increases independence and autonomy	Enables control and espionage systems
Improves public safety/emergency response	Enables fast transmissions of military data
Improves health and longer lifespan	Small-cells antennas emit harmful electromagnetic waves and affect health
Increases access to healthcare	Higher radio frequencies (RF) expose individual to health risks
Drives economic growth and sustainability	High costs for 5G rollout and related infrastructure maintenance, in addition to high competition between companies
Shorten commute times	Difficulty of widespread and access to rural areas

### 5G Pros

Certainly “5G is expected to provide important economic benefits globally”. In addition to bringing “substantial networks improvements, including higher connection speeds, mobility, and capacity, as well as low-latency capabilities. In doing so, it enables new use cases and applications that will positively impact different industry sectors” (GSMA, 2018, p. 3).

Therefore, administrations all over the world are taking into consideration the large scope of opportunities that will be afforded by 5G networks in the future. Especially that there are expectations that the implementation of millimeter wave (mmWave) broadbands during 5G applications will have a direct contribution to gross domestic product (GDP) (GSMA, 2018, p. 2).

The previous briefly shows 5G pros in terms of economics and technology, noting that GSMA study concludes, under conservative assumptions, that “by 2034 mmWave spectrum will underlie an increase of \$565 billion in global gross domestic product GDP and \$152 billion in tax revenue, producing 25% of the value created by 5G” (GSMA, 2018, p. 3).

In spite of the claimed bad effects on healthcare – which will be mentioned in the Cons part – 5G is achieving a real technological evolution in the healthcare system, its benefits “will be felt differently by each of the key participants in the healthcare value chain: providers, payers and pharmaceutical companies. But on the whole, 5G networks hold out the promise of major improvements in efficiency and outcomes, positive results that ultimately feed through to patients” (PwC, 2020, p.5).

And with all the innovative applications it provides: Robotics, Internet of things (IoT), and Artificial Intelligence (AI)... the use of 5G will definitely increase in the healthcare system, in a way that will convert it to an ecosystem. This ecosystem “will align with a relatively recent idea known as the 4P medicine: predictive, preventive, personalized and participatory” (PwC, 2020, p.7). In brief, three main advantages of 5G can be owned in the healthcare system if adopted by the healthcare companies: ultra-fast broadband, ultra-low latency, and massive machine connectivity (PwC, 2020, p.11).

Moreover, as mentioned before, and besides gross domestic product GDP, new technology options as faster connection, AI, and IoTs, 5G has a positive impact on peoples’ daily lives no matter where they live.

### 5G Cons

As for the cons, the rumors have been much more numerous, and this is mainly because of the critical competition between the biggest companies and the rival governments supporting them, which has divided the world into a category of people eager to surf on internet at high speeds with all innovative options, and another category scared about the drawbacks of this 5G technology.

And keeping in mind that old phones and devices are not eligible for its application, and that its coverage will not be even and equal to all users all over the world, 5G network has extremely high costs of subscription, where the surfers use more data at higher speed (Gunnarsson, 2020).

"Alongside depleted batteries, users are reporting that cell phones are getting increasingly hot when operating on 5G" (ECN, 2020).

But what is more suspected and worrying are the cybersecurity threats, that can take form in a wide variety of attacks as displayed by the Russian cybersecurity company, Kaspersky (n.d.):

- **Botnet attacks** control a network of connected devices to puppeteer a massive cyberattack.
- **Distributed denial-of-service (DDoS)** overload a network or website to take it offline.
- **Man-in-the-Middle (MiTM) attacks** quietly intercept and change communications between two parties.
- **Location tracking and call interception** can be done if someone knows even a small amount about broadcast paging protocols.

Moreover, health risks have not been studied enough until now, but many claims of health damages were associated to 5G network, especially with Covid-19 pandemic widespread. Although nobody is sure about the nature of side effects that would be caused by 5G waves, but in 2019, and prior to Covid-19 outbreak, Dariusz Leszczynski, an expert in molecular biology and Adjunct Professor at the University of Helsinki, Finland, told Euronews that "the assurances of safety concerning 5G-emitted radiation are based solely on the assumption that low amounts of radiation are safe, not on biomedical research" (Beswick & Fischer, 2019).

Furthermore, and since its outbreak, Covid-19 was linked to 5G in most of the analyses, claiming that 5G frequencies could exacerbate its spread and suppress the immune system. (Kennedy, 2020).

However, and according to the last statements given by the World Health Organization WHO "and after much research performed, no adverse health effect has been causally linked with exposure to wireless technologies. (...) Tissue heating is the main mechanism of interaction between radiofrequency fields and the human body. Radiofrequency exposure levels from current technologies result in negligible temperature rise in the human body. As the frequency increases, there is less penetration into the body tissues and absorption of the energy becomes more confined to the surface of the body (skin and eye). Provided that the overall exposure remains below international guidelines, no consequences for public health are anticipated" (WHO, 2020).

### CYBER-DIPLOMACY METHODS

Thinking about all these conspiracies linked to 5G, especially in terms of cybersecurity – whether they were true or baseless – brings into mind the cyberspaces of competing states in addition to their ways in putting cyber norms and facing cyber threats. Noting that at the London Summit in 2019, the 29

members of NATO agreed to “guarantee the security of our communications, including 5G” (Dinucci, 2019).

Thus, cybersecurity is a matter of high interest for all. And in order for them to protect their interests and to overcome surprising challenges, they referred to a distinct type of interaction: Cyber-diplomacy!

It is necessary to understand how the United States and China are figuring out a way to manage their concerns of security during the peak of their competition over technology, especially that The NATO Cooperative Cyber Defense Centre of Excellence quotes ancient Chinese philosopher Sun Tzu's “The Art of War,” to summarize its opinion on Huawei's and China's real intention: “The supreme art of war is to subdue the enemy without fighting” (Kaska et al., 2019, p. 4).

Cyber-diplomacy is the international emerging practice used by the US and China during the current escalation of the national security debate, noting that “a potential threat anywhere in the network will be a threat to the whole network” (Reichert, 2018). And none of these competitors accepts to be threatened in any way, so they used cyber-diplomacy even before the release of 5G to overcome the expected hurdles.

“Cyber-diplomacy can be defined as diplomacy in the cyber domain or, in other words, the use of diplomatic resources and the performance of diplomatic functions to secure national interests with regard to the cyberspace” (Barrinha & Renard, 2017, p.355). Practically, it is a natural response to the increasing relevance to cyberspace globally, especially after being threatened recently, and “through cyber-diplomacy states collaborate to respond to and addresses the cyber dimensions of international conflicts, crime, and information security” (Khabbaz, 21, p. 1).

### **USA’s Cyber-Diplomacy**

USA makes a great example for states relying on cyber-diplomacy for their cyberspace security: it has cooperated with other European states since the pre-release of 5G and developed its “National Strategy to Secure 5G” where it called for adopting the “5G security principles” outlined in the 2019 Prague Security Conference: Prague Proposals”. (Khabbaz, 21, p. 1).

So, in March 2020, while Donald Trump was still president, the US National Strategy to Secure 5G was released, and it included 4 lines of efforts: 1- Facilitate Domestic 5G Rollout; 2- Assess Risks & Identify Core Security Principles of 5G Infrastructure; 3- Address Risks to United States Economic and National Security During Deployment of 5G Infrastructure Worldwide; 4- Promote Responsible Global Development and Deployment of 5G. (White House, 2020).

Much more, one of the main activities of the National Strategy was a plan for Diplomatic Engagement, where they have included diplomatic activities with partner countries and allies, based on “diplomatic engagement to share information and findings on 5th and future generations wireless communications systems and infrastructure equipment standards to promote maximum interoperability, competitiveness, openness, and secure platforms” (White House, 2020). Eight main elements formed the key tactics of this plan:

1. Raise Awareness Among Allies and Partners on Security Risks.
2. Encourage Allies and Partners to Take Concrete Actions to Protect their 5G Networks.
3. Encourage use of Trusted 5G Vendors.
4. Partner with Like-Minded Countries.

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5. Public Diplomacy.
6. Promote the Prague Proposals.
7. Multilateral Engagement.
8. Encourage Allies and Partners to Require a "5G Clean Path" for Overseas Facilities.

This diplomatic plan was thoroughly based on security measures concerning the cyberspace of US and its allies, and on US national interests. It is quite different from a normal diplomacy plan because it addresses technical matters rather than political ones, even if in some areas they are convergent and complement themselves – especially of the politico-economic impact of 5G implementation – but it is still implemented by diplomats of all involved governments. 5G was referred here to technical matters, because “cyber issues were treated first as purely technical issues, then as external aspects of domestic policies, before they came recognized as a major foreign policy topic” (Barrinha & Renard, 2017, p. 358).

Therefore, coordinating US’s diplomatic engagement on cyber issues related to 5G is a remarkable act, especially that it has attained China since 2015 with a bilateral Cybersecurity agreement concerning economic espionage (Brown & Yung, 2017). After having accusing Huawei of abusing the Cybersecurity Law and prohibiting several government agencies since 2012 “on the grounds of national security risk, from acquiring products from Huawei and ZTE” (Rugge, 2020, p. 4).

### **China’s Cyber-Diplomacy**

China’s approach to cyber-diplomacy differs from that of the USA, for it is being more offensive than defensive. It is driven by the “overarching objective of become a cyber superpower in the economic, normative, military and commercial realms – one that harnesses the power of digital technologies and innovation to achieve global technological leadership and modernize economic development” (Bozhkov, 2020).

However, and putting the objective aside, China’s cyber-diplomacy is based on its promotion for Cyber-sovereignty “as an organizing principle of internet governance, in direct opposition to US for a global, open and secure internet”. And unlike the USA who exclusively implements cyber-diplomacy with its allies and partners countries, China went to the UN in 2017, and called for a “multilateral approach to governing cyberspace, with the United Nations taking a leading role in building international consensus on rules” (Segal, 2017).

Also, and after the opposition of US and its allies to China’s idea of state sovereignty in cyberspace, China’s representative noted in his opening statement at the Open-Ended Working Group (OEWG) meeting in September 2019 that it was “widely endorsed by the international community that the principle of cyber sovereignty applies in cyberspace” (Segal, 2020, p. 3).

From another side, we can say that China has not only referred to the international community through the UN only, but has also worked on its cyber-diplomacy strategy through its allies, mainly Russia, but in a method different than the American one. Beijing worked on Moscow to become a promoter for its “ideas” and opinions at the UN too, in a way that convenes its national interests; this is why Russia worked on promoting the Cybercrime treaty at the UN (Segal, 2020, p. 4).

Furthermore, China was not content with cyber diplomacy only, but combined commercial diplomacy to it. And this appears clearly in the “digital silk road” of the Belt and Road initiative, where Chinese



companies invest in “cross-board optical cables and other communications trunk line networks, transcontinental submarine optical cable projects” (Segal, 2020, p. 4).

By this, one can understand that Chinese companies are searching for new markets and customers for their 5G items and products, while the Chinese government provides support to the BRI countries in terms of economy, strategy and sometimes politics. And according to the Financial Times magazine, “China’s Export-Import Bank financed 85% of the China-Pakistan Fiber-Optic Project, for example and loaned to Nigeria the full cost of a Huawei-built 5G network” (Weinland, 2019).

This paper cannot forget to mention neither the “smart cities” that China is working on building across many states, and through which it competes with suppliers from Europe and US, nor the leadership of Chinese firms in terms of AI surveillance technology used for public security (Segal, 2020, p. 5).

For concluding, when a superpower releases a national strategy to combat 5G threats, and another one promotes 5G rollout and requires surveillance, this means that the challenge is real, and 5G is a new international topic over which superpowers are typically competing.

## DISCUSSION

Ex-President of the United States, Donald Trump has expressed many times his worries towards the escalating economic capabilities of China... And herein, Biden came to thoughts... But as Michael Mccloughlin (2020) stated: “Biden's victory doesn't look like it will mean much change on the US side”. But the world’s attention is now focused on the way in which Joe Biden will manage this “revolution”.

As far as tech industry is concerned, Google has finished its relations with Huawei after Trump’s veto; and so, this has left Huawei’s devices without the mobile services and apps customized by Google. However, due to the huge difference in costs of other brands devices compared to Huawei’s ones, market sales have suffered, and phone shipment orders have globally decreased by 23% in the third quarter of 2020, according to Canalys, and by 24% according to Counterpoint Research (Mccloughlin, 2020). That is why, dealers are obliged to neglect the decision of banning Huawei’s devices in their countries, for their own benefit, and that of the customers.

In addition: “Now, according to Financial Times, tough U.S. sanctions this year against Huawei could be less threatening to its overall business than previously thought. And according to analysts, the company’s important smartphone arm might have a chance to recover. Less threatening to Huawei means more threatening to Google and its lock on the worldwide Android ecosystem” (Doffman, 2020).

In terms of healthcare, recent observations have raised concerns regarding the 5G effect on the human health, especially after the mystery of Covid-19. Many debates are arguing on either it is really dangerous or does not have any negative repercussion on human health. This study does not settle the debate but represents a comparison between the pros and cons of 5G evolution on the healthcare system, in this period.

Thus, 5G has succeeded in creating a vision to turning out healthcare system to SMART one. And according to an article shared by Oxford Academic, one month before the first Chinese infection of Covid-19 has been identified: “5G will reconstruct the healthcare system by intelligently improving the quality of medical service, balancing the distribution of medical resources between urban and rural areas, and reducing the burden of healthcare costs” (Li, 2019).

## CONCLUSION

In summary, in terms of economics, this paper shows that the gradual rise of 5G and its innovations, coincided with slowing down productivity and the Gross Domestic Product growth in developed countries. Indeed, one analysis mentions that "the US economy loses \$ 1tn each year due to too much information and interruption" (Konzept, 2019, p. 7). So, guess its losses during 5G phase!

Technologically speaking, 5G is considered as a revolution of a new kind: "this new technology will be the backbone that enables advances such as smart cities, driverless cars, remote controlled operating theatres, automated farms and more besides" (Cooper, 2018).

In terms of healthcare, this study agrees that "there is no concrete evidence of health damage due to 5G electromagnetic waves, although it is not scientific and illogical to prove the non-existence of negative effects" as Prof Dr. Alexander Lerchl told Euronews (Beswick & Fischer, 2019).

But this study realizes that, the fear of 5G network, is more linked to politico-economic balances between Nations than related to health – Notice the USA has taken a banning decision against Huawei, but never against its main alternatives Nokia or Ericsson. "The risk is not the same with European manufacturers as with non-European ones" said Macron's team (Mcloughlin, 2020).

However, and regardless of superpowers interests, it is better for every individual to be cautious from their blind race for influence.

**KEYWORDS:** 5G, Cyber-diplomacy, Digital Sovereignty, Geoeconomics, Techno-war.

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## 8. What Will Cybersecurity's "New Normal" Look Like?

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