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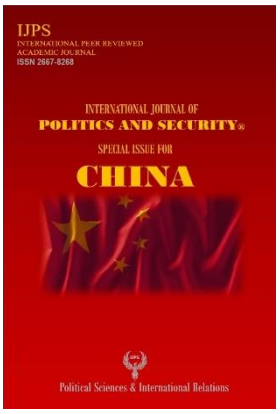

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Huawei, 5G Networks, and Digital Geopolitics

Gökhan TEKİR*

Abstract

The new global competition between the United States of America (USA) and China is shaped by access to the flows of the networks. This competition intensified particularly on 5G networks. China has already surpassed the USA in the development of 5G technology with its trademark company Huawei and has stepped up its efforts to reach global market. In addition to building railroads and roads, China also engages in developing digital infrastructure for the countries, which legged behind in terms of digital infrastructure. China's efforts of upgrading digital infrastructure include laying out fiber optic cable networks on which 5G networks are built. Huawei also expanded into European countries, which want to upgrade its domestic 5G networks. U.S. government perceives China's digital expansion as a security risk toward infrastructure networks. Hence, it intensified its efforts to restrict Huawei's access to global market. Thus, instead of striving to control of a particular territory, the USA and China seeks to gain influence over networks, hubs, and services. Although China and the USA are main actors, this confrontation includes regional bodies such as the European Union (EU) and multinational companies.

Keywords: *China, Digital Geopolitics, Networks, Huawei, USA, 5G.*

Huawei, 5G Ağları ve Dijital Jeopolitik

Özet

Amerika Birleşik Devletleri (ABD) ve Çin arasındaki yeni küresel rekabet, iletişim ağlarına erişim üzerinde şekillenmektedir. Bu rekabet özellikle 5G ağları üzerinde yoğunlaşmaktadır. Zaten Çin ABD'yi 5G teknolojisi geliştirme konusunda, marka şirketi Huawei ile geçti ve küresel pazara açılma çabalarını artırdı. Çin, demir yolu ve karayolu inşasının yanı sıra dijital altyapı açsından geride kalmış ülkeler için dijital bağlantıları geliştirmeyi de ön plana almıştır. Çin'in dijital altyapı geliştirme çalışmaları 5G ağlarının üzerine inşa edildiği fiber optik kablolarının yapımını da içermektedir. Huawei kendi 5G ağlarını geliştirmek isteyen Avrupa ülkelerine doğru da genişlemeye başlamıştır. ABD hükümeti Çin'in teknolojik genişlemesini altyapı ağlarına yönelik bir güvenlik tehdidi olarak algılamaktadır. Bundan dolayı, Huawei'nin küresel pazara girişini engelleme çabalarını yoğunlaştırmıştır. Böylece, herhangi bir toprak parçasını kontrol etmekten ziyade ABD ve Çin iletişim ağları, bağlantı merkezleri ve hizmet sağlayıcıları üzerinde etkili olmaya çabalamaktadır. Çin ve ABD ana aktörler olmakla birlikte, bu yüzleşme Avrupa Birliği (AB) ve çok uluslu şirketleri de içine almaktadır.

Anahtar Kelimeler: *ABD, Ağlar, Çin, Dijital Jeopolitik, Huawei,5G.*

1. Introduction

The traditional geopolitical competition over controlling fixed territories and natural resources is being replaced in a swiftly changing world. During the Cold War, the interconnection between the two blocks had been limited. After the end of the Cold War,

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however, a world, characterized by interconnection and interdependence has emerged. Trade, communication, and financial links among states proliferated. The development of technology strengthened the links between populations. For instance, in 2020 it is estimated that 80 percent of world population has smartphones.[1]

Hence, under this newly structured environment, the significance of digital technologies has increased. China unveiled a gigantic project called the Belt and Road Initiative in 2013. This project aimed at providing infrastructural, financial, trade, people to people, and digital connectivity among the participant countries. The term of connectivity is, thus, placed at the center of this initiative. Providing digital infrastructure is also an important component of China's endeavors. Besides laying out cross-border cables for Central Asian countries, China aims to upgrade and expand information exchanges and cooperation.[2] In line with these expressed goals, Chinese company Huawei increased its presence in many countries in the development of 5G technology, which will revolutionize the network communication. Already suspecting of China's motives in China's export of infrastructure and digital technology, the USA has banned the use of Huawei in its domestic market and issued an ultimatum to the countries, which would integrate 5G technology into their infrastructure networks.

This confrontation between China and the USA is the manifestation of the new dimension of the geopolitical competition. The power struggle in the world politics remains, but it transforms. Instead of a territorial battleground, the countries, the multinational companies, and the regional organization collaborate, confront, and compete in the digital space. Access to digital networks, securing the digital data, and gaining influence over internet are the main elements of this competition.

This paper tries to analyze the struggle over networks between China and the USA. Firstly, literature review presents the concepts of networks and digital geopolitics. The literature review also addresses how novelties that 5G technology will bring are being conceived by policymakers or technology developers. Then, the paper discusses Huawei's

[1] Mark Leonard, "Introduction: Connectivity Wars," in *Connectivity Wars Why Migration, Finance and Trade Are The Geo-Economic Battlegrounds Of The Future*, ed. Mark Leonard (London: The European Council on Foreign Relations, 2016), 15.
[2] "Vision and Actions on Jointly Building Silk Road Economic Belt and 21st-Century Maritime Silk Road," *Ministry of Foreign Affairs of the People's Republic of China*, (2015), https://www.fmprc.gov.cn/mfa_eng/zxxx_662805/t1249618.shtml (17.05.2020).

emergence and its rise in technology market. It analyzes Huawei's role in 5G networks and U.S. response to this challenge. While discussing the rivalry between China and the USA, the other actors' involvement is also investigated.

2. Literature Review

2.1. Networks and Digital Geopolitics

A network can be defined as a set of interconnected nodes. Although networks have always existed, the most important novelty in the transformation of the world is the pervasiveness of networks because of the technological advancements. Networks penetrated into economy, society, culture, and politics. The generality of networks assumes transition from hierarchically formed of activity to networking form of activity. Thus, they create a new form of organizational structure.[3] A new technological paradigm emerged in the USA in 1970s, which engendered a new way of production, communication, and living, had affected the organization of society and business world. Although the initial background of this advancement was accomplished by U.S. government, the Silicon Valley took the leading role. The personalized technological devices have led to interactivity, networking, and more technological breakthroughs.[4]

The flow of information had already existed. The enormous change in the flow of information is digitalization which increased the speed of sharing information. Another improvement through digitalization is the increasing size of information that can be disseminated across the networks.[5] Networks accelerate the flow of exchange, solidifying globalization. For example, financial networks such as SWIFT network speeds up money transactions. Logistics networks link local manufacturing sectors to global supply chains. The Internet allows the exchange of opinions almost simultaneously.[6]

The networks of interaction configure a space of flows in which social practices occur without territorial proximity. It is made up by hubs and nodes where the connections and activities are formed. For example, Wall Street is a hub for financial activities whereas the

[3] Manuel Castells, "The Contours of the Network Society," *The Journal of Futures Studies, Strategic Thinking and Policy* 2, no.2 (2000): 152.
[4] Manuel Castells, *The Rise of The Network Society: The Information Age: Economy, Society and Culture,* (West Sussex: Wiley-Blackwell, 2010), 5.
[5] Joseph Verbovszky, "Networked Geopolitics," *The American Academy in Berlin,* https://www.americanacademy.de/networked-geopolitics/ (10.05.2020).
[6] Henry Farrell and Abraham Newman, "Weaponized Globalization: Huawei and the Emerging Battle over 5G Networks," *Global Asia*, (2019), https://www.globalasia.org/v14no3/cover/weaponized-globalization-huawei-and-the-emerging-battle-over-5g-networks_henry-farrellabraham-newman (20.05.2020).

Silicon Valley is hub for technology. The space of flows provides secured and secluded surroundings for actors for the operation of networks. These surrounding could be virtual such as websites or real such as VIP lounges.[7] Though the nodes, the actors come together and interact. The relational aspect of networks improves the actors' ability of learning and transmitting knowledge. This interaction generates trust and cooperation by allowing exchange of information.[8]

Yet, it will be naive to represent the networks solely as places of cooperation. The networks can also be source of confrontation and competition. Castells argues that cooperation depends on communication between networks. Competition arises one actor outperforms by superior efficiency in cooperation capacity. It will take destructive form when communication abilities of other actors are compromised.[9] Moreover, networks can be used to restrict the newcomers either intentionally or through setting up barriers. The first actors which establish the networks affects the rules of adopting the technology; thus, making it harder for other actors to participate.[10] Networks are, therefore, both sources of connectivity and confrontation.

Since networks have huge effect in organizing economy, political, and social order, the power struggle over the networks shapes geopolitical confrontation. Technological changes, which fueled network society also affect the dimension of geopolitics. Social media applications such as Twitter, Facebook, and Instagram are the platforms where billions of people share experiences and opinions by interacting with each other. In the past three years, the effects of social media over the Russian meddling into U.S. elections, the polarization in U.S. domestic politics, and spreading hatred towards ethnic groups in Myanmar, India, and other countries have been widely discussed.[11] These examples were the selected cases, which show the influence of digital technology over geopolitical events. As digital technology becomes more entrenched in the lives of people, its effect will increase.

[7] Manuel Castells, "Grassrooting the Space of Flows," *Urban Geography* 20, no. 4 (1999): 295.
[8] W. Powell, "Neither Market nor Hierarchy: Network Forms of Organization," *Research in Organizational Behavior* 12 (1990): 304.
[9] Manuel Castells, "Informationalism, Networks, and the Network Society: A Theoretical Blueprint," in *The Network Society*, ed. Manuel Castells (Northampton: Edward Elgar Publishing, 2004), 4.
[10] Powell, "Neither Market nor Hierarchy: Network Forms of Organization," 304.
[11] "The Geopolitical Repecussions of the Digital Age," *Luminae Group*, (2019), https://www.luminaegroup.com/blog/geopolitics-digital-disruption (10.05.2020).

In fact, geopolitics has been influenced by the technological changes throughout history. The advancements in steal and powder technology enabled the European countries to establish and expand its colonial empires. The nuclear bomb ended the Second World War and nuclear deterrence maintained the bipolar world order for decades. Currently, digital technologies created a platform arena in which the articulation of political voices, the collection of individual identities, and national security are carried out. These duties once belonged to the nation-states, are mostly shifted to digital arena, creating a hybrid of the Westphalian nation-state and cloud state.[12] In line with the hybrid character of the state, the geopolitical struggle carries same hybrid characterization. The term of geopolitics denotes the struggle among fixed territorial units, but the term digital includes multinational companies and transnational networks. A definition of digital geopolitics is provided by Annegret Bendiek, Nadine Godehardt, and David Schulze. According to their conceptualization, digital geopolitics "involves decentralised transnational networks that consist of the connectivity between non-state actors and multinational companies, platforms, hubs, content and infrastructures, extending beyond politically fixed territorial units."[13]

Despite the involvement of other actors, the states remain the major players in digital geopolitics. Yet, their goals and methods change. The network flows, unlike fixed territorial units, cannot be contained and controlled, but influenced. States gain power in the networks by building and cultivating dependencies. Creating dependencies is related with generating the source of flow. This enables the generator of the network to leverage the flow to other participants of the networks.[14] A first-mover advantage, gained through being the first to network, therefore, is vital for influencing the operationalization of networks. It is expected that states race to gain the advantage of being a first mover in the creation of the technological networks. The confrontation over development of 5G technology between China and the USA is the latest example of this competition. China and the USA strive to gain dominance in generating and operating 5G network. Before, analyzing this competition, it will be beneficial to offer insight about the novelties that 5G technology will bring.

[12] Samir Saran, "Navigating the Digitisation of Geopolitics," *Observer Research Foundation*, 2020 https://www.orfonline.org/expert-speak/navigating-the-digitisation-of-geopolitics-60612/ (10.05.2020).
[13] Annegret Bendiek, Nadine Godehardt, and David Schulze, "The Age of Digital Geopolitics," *International Politics and Society*, (2019), https://www.ips-journal.eu/in-focus/chinas-new-power/article/show/the-age-of-digital-geopolitics-3593/ (10.05.2020).
[14] Verbovszky, "Networked Geopolitics".

2.2. 5G Networks: A Groundbreaking Technology

5G is the new fifth generation mobile network. It is different from its predecessors 2G, 3G, and 4G, which are voice centric, in that it is designed to handle large numbers of devices and high data-rates. 5G networks are comprised of three layers of networks. The first is enhanced mobile network, which makes the flow of communication faster. For example, 5G shortens the duration of movie downloads from 7 minutes to 6 seconds. The second is ultra-reliable low latency communication, which enables the connection with autonomous vehicles. The use of low latency makes connection 60 or 120 times faster than 4G. The third is machine-machine communication, which enables the communication among machines.[15]

The development of 5G has consequences for the economy and society. Steven Wu, the senior product manager of Huawei, comments on the revolutionary aspect of 5G technology: "4G changed lives, but 5G will change society – industry application will be a very important trend of 5G."[16] By integrating the digital, biological, and physical worlds 5G unleashes the fourth industrial revolution. Autonomous and smart systems incited by data and machine learning lead to an important improvement to industrial production. The enhanced level of communication is facilitated by 5G technology.[17] 5G allows businesses to reach data faster and to make decision quicker. Thus, innovations in agriculture and industry will be cheap and easy, facilitating cost-savings for businesses and better experience for customers. Besides economy, 5G also has an impact on society. 5G enables the connection of electronic devices for smart cities, smart schools, smart homes, smart automobiles, and smart health centers, providing a more efficient and secure environment.[18] 5G does not only provide linkages between people or between machines, but it unveils a system in which machines are integrated into critical infrastructures, which improve human life. It started to be used to perform remote medical operation. In January 2019, the world's first long distance medical operation was performed in China on an animal. In August, a patient in the Chinese city Sanya was implanted with a stimulation device by a doctor in Beijing, who is almost 2000

[15] Morten Springbord, *The New Tech War and The Geopolitics of 5G*, (Copenhagen: Worldwide Asset Management, 2019), 2–3.
[16] James Barton, "4G Changed Lives. 5G Will Change Society – Huawei's Steven Wu," *Developing Telecoms*, (2019), https://www.developingtelecoms.com/telecom-business/q-and-a-interviews/8393-4g-changed-lives-5g-will-change-society-huawei-s-steven-wu.html (16.05.2020).
[17] Mark Newman, "5G & The Fourth Industrial Revolution," *UK5G*, (2020), https://uk5g.org/5g-updates/read-articles/5g-fourth-industrial-revolution/ (15.05.2020).
[18] "5G Explained: How 5G Work," *EMF Explained*, (2020), http://www.emfexplained.info/?ID=25916 (14.05. 2020).

miles away from Sanya. These operations were made possible through 5G technology, which reduces latency to 2 milliseconds between devices.[19] The medical sector is just one of the sectors in which the effects of 5G technology started to be observed. 5G has a potential to change economic and social life in an unprecedented level.

The enormous effect of 5G on society and economy invites not only competition among companies but also geopolitical confrontation between states. 5G technology starts a new industrial revolution and changes society in a large scale through reaching the operation of infrastructure. A research report prepared for the Congress states that 5G could create 3 million jobs and add $500 billion to the country's GDP.[20] The China Academy of Information and Communications Technology estimates that the contribution of 5G will boost the Chinese economy RMB2.9 trillion and add 8 million jobs.[21] The enormous effect of 5G on society and economy invites not only competition among companies but also geopolitical confrontation between states. Setting up 5G networks has become increasingly politicized as influencing 5G networks of another country offers significant advantage to the countries, which would have first-mover advantage.

Currently, there are three companies, which provide 5G technology: Chinese Huawei, Finnish Nokia, and Swedish Ericsson. However, the share of R&D that Huawei allocated in 5G is bigger than Nokia and Ericsson. In 2017, Huawei's 5G R&D budget approximates $15 billion, outspending Nokia and Ericsson's total investments, $6 billion and $4.6 billion, respectively.[22] Thus, Huawei assumes a leadership position in the development of 5G. As a result of this dominant position in R&D, Huawei managed to surpass its competitors. This centered position of Huawei in R&D of 5G networks places it to be the focal point of geopolitical struggle between China and the USA. Huawei's close ties with the Chinese government raises suspicions about its intentions in influencing 5G networks.

[19] Caroline Frost, "5G Is Being Used to Perform Remote Surgery from Thousands of Miles Away, and It Could Transform the Healthcare Industry," *Business Insider*, (2019), https://www.businessinsider.com/5g-surgery-could-transform-healthcare-industry-2019-8 (15.05.2020).
[20] *Fifth-Generation (5G) Telecommunications Technologies: Issues for Congress* (Washington D.C.: Congressional Research Service, 2019), 8.
[21] *China Is Poised to Win the 5G Race Key Steps Extending Global Leadership* (Ernst & Young, 2018), 7.
[22] Rick Nelson, "China's Huawei Seeks to Dominate 5G Standards Development," *Evaluation Engineering*, (2018), https://www.evaluationengineering.com/industries/communications/wireless-5g-wlan-bluetooth-etc/article/13017349/chinas-huawei-seeks-to-dominate-5g-standards-development (16.05.2020).

3. Huawei: China's Tool?

Huawei was found in 1987 by Ren Zhengfei, who was an erstwhile engineer in the People's Liberation Army (PLA) and member of the communist party.[23] The background of its founder as a former PLA member indicates the close relationship between Huawei and the Chinese government. The foundation of the company is also related with China's official state policies. In 1978 Deng Xiaoping, the Chinese leader who integrated China to the world in post-Mao era, published a guidance for China in which he set up four main goals for the state. Upgrading technology is one of these four main goals. Deng claims that the growth in agriculture and industry relies on technological developments in which changes are calculated in terms of days and hours instead of months and years. Hence, China should focus on using and making advanced technologies.[24] Almost a decade later after this proclamation, Huawei was founded. The foundation of Huawei can be considered as a step towards realization of this goal.

The global operations of Huawei have been conducted in line with China's official proclamations. In 2000 Huawei started its global operations in the areas neglected by the Western companies such as Africa, the Middle East, and the South Asia.[25] Huawei's global opening was made possible after the initiation of "Going Global" policy of the Chinese government. The first "Going Global" policy was formulated by the then-Premier Zhu Rongji in 2000. Through this policy the companies in China were encouraged to invest abroad. This policy was initiated to make Chinese companies more competitive in the global market and propel Chinese companies to reach to human capital resided in the world and technological investments from foreign companies. "Going Global" was accelerated via China's accession to the World Trade Organization (WTO). It was also included in China's 10th Five Year Plan (2001-2006), identifying "Going Global" as a necessary strategy in the road of globalization.[26]

Huawei successfully implemented "Going Global" strategy formulated by the central government. After spreading to the technologically backward regions of the world, Huawei

[23] Guan Chong, *Huawei Chinese Telecommunications Giant Huawei: Strategies to Success,* (Singapore: Nanyang Technopreneurship Center, 2019), 3.
[24] Deng Xiaoping, "Realize the Four Modernizations and Never Seek Hegemony," (1978), http://www.china.org.cn/english/features/dengxiaoping/103389.htm (18.05.2020).
[25] "The Early Years," *Huawei*, (2020), https://huawei.eu/story/early-years (17.05.2020).
[26] Heino Klinck, *The Strategic Implications of Chinese Companies Going Global,* (Kansas, 2011), 5–6.

earned its first contract in Europe in 2004. It signed partnership agreements with major companies such as Vodafone and Symantec. As of 2007, it partnered with all the top carriers in Europe. Despite the initial setbacks in the North American market, Huawei managed to secure cooperation with US mobile carrier company Leap Wireless in 2007, using 3G network. The further expansion of Huawei into the USA was met with the resistance of the Committee on Foreign Investment (CFIS) in the USA, marking out the USA as the most difficult market for Huawei.[27]

The further spread of 5G by Huawei in the global market is linked with China's "Going Global 2.0" strategy. "Global Going 2.0" is initiated to improve "Going Global" strategy promulgated two decades ago. "Going Global 2.0" reflects China's aspiration to become a norm setting power in the global arena. The most conspicuous element in "Going Global 2.0" is 5G mobile technology. By developing 5G technology China weighs in promoting international standards.[28] In line with "Going Global 2.0", Made in China 2025 strategy announced in 2015 strengthened China's claim of producing high-tech products. This strategy focuses on producing and exporting smart technology such as automotive, aviation, robotics, and high-tech infrastructure related products, and 5G.[29] The foremost goal is to transition China from low-end manufacture producer to high-end technology producer. This goal is made possible through the investments into R&D and innovations.[30] Developing 5G technology is one of the components of Made in China 2025 strategy. Made in China 2025 document described 5G as "core technology and architecture of the future network."[31] Besides these laid out plans, the Belt and Road Initiative, announced in 2013, and helped China to export its technology, produced in China, to the participant countries of the Belt and Road Initiative, which constitute a large part of the world.

The Belt and Road Initiative consists of two main parts: The Silk Road Economic Belt which provides land connection between China and Russia, Central Asia, Europe, Southeast

[27] Cui Fengru and Liu Guitang, *Global Value Chains and Production Networks Case Studies of Siemens and Huawei*, (London: Academic Press, 2019), 130–31.
[28] *China Going Global between Ambition and Capacity*, (Beijing: China Policy, 2017), 5.
[29] Jost Wübbeke et al., *MADE IN CHINA 2025 The Making of a High-Tech Superpower and Consequences for Industrial Countries*, (Berlin, 2016), 6.
[30] Melissa Cyrill, "What Is Made in China 2025 and Why Has It Made the World So Nervous?," *China Briefing*, (2018), https://www.china-briefing.com/news/made-in-china-2025-explained/#:~:text=Made in China 2025 seeks,value-added global sourcing segment (17.05.2020).
[31] "Made in China 2025《中国制造 2025》," (2015), http://www.cittadellascienza.it/cina/wp-content/uploads/2017/02/IoT-ONE-Made-in-China-2025.pdf (18.05.2020).

Asia, and South Asia. The Maritime Silk Road connects China's ports with the other ports located in the Indian Ocean, the Mediterranean, the South China Sea, and the Pacific Ocean.[32] The connectivity laid out in these projects is mainly related to physical infrastructure connectivity, involving constructing roads, railways, trade hubs, and ports.

The main focus of the Belt and Road Initiative in the literature has been diverted to railroads, roads, and ports. However, the Vision and Actions paper also mentions information connectivity planned to be upgraded through building cross-border optical cable networks.[33] Initially, three main companies, China Telecom, China Mobile, and China Unicom, participated in laying out cable projects in the South Asia, the Middle East, and Europe. China accounts for the construction of 7 percent of transnational cable networks between 2012 and 2015, and 20 percent between 2016 and 2019.[34] 5G network technology is being built on fiber-optic cable networks. Fiber-optic cables increase the flow of data traffic. Utilizing cable networks, the Chinese companies entered into the markets of telecommunication networks of the countries across Belt and Road route. The spread of 5G networks also accelerated due to these infrastructure plans. Huawei is expected to dominate 5G sector in the participant countries of the Belt and Road Initiative.[35]

After the start of the Belt and Road Initiative, 5G networks penetrated into the participant countries. Myanmar, whose population did not even access to mobile technology in 2017, made a deal with Huawei to bring 5G technology by 2025.[36] In 2019 Huawei entered into Serbian, Russian, and Cambodian market to develop 5G by establishing partnerships with local mobile companies.[37] Except the countries, which have strong reservations concerning Huawei's participation in 5G networks, Australia, Japan, New Zealand, and the United States, other countries has not restricted Huawei's 5G development projects.[38]

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[32] "Vision and Actions on Jointly Building Silk Road Economic Belt and 21st-Century Maritime Silk Road," 2015.
[33] "Vision and Actions on Jointly Building Silk Road Economic Belt and 21st-Century Maritime Silk Road," 2015.
[34] Hong Shen, "Building a Digital Silk Road? Situating the Internet in China's Belt and Road Initiative," *International Journal of Communication* 12 (2018): 2692.
[35] Andrew Kitson and Kenny Liew, "China Doubles Down on Its Digital Silk Road," *Reconnecting Asia CSIS*, (2019), https://reconnectingasia.csis.org/analysis/entries/china-doubles-down-its-digital-silk-road/ (20.05.2020).
[36] Ajey Lele and Kritika Roy, *Analysing China's Digital and Space Belt and Road Initiative,* (New Delhi: Institute for Defence Studies and Analyses, 2019), 42.
[37] Kitson and Liew, "China Doubles Down on Its Digital Silk Road".
[38] Emily Feng, "China's Tech Giant Huawei Spans Much Of The Globe Despite U.S. Efforts To Ban It," *NPR*, (2019), https://www.npr.org/2019/10/24/759902041/chinas-tech-giant-huawei-spans-much-of-the-globe-despite-u-s-efforts-to-ban-it (29.05.2020).

Huawei mostly benefited from globalization, which means transcending nation-state boundaries in conducting social, economic, and political activities. It set up bases and centers in various countries. In the annual report prepared by Huawei in 2019, Huawei is reported to operate in over 170 countries, building over 1500 networks.[39] 70 percent of Huawei's workers outside China are local workers. This indicates Huawei's globalized feature as a company.[40]

Huawei's structure might be globalized, but Huawei's operations are also in conformity with the Chinese government's grand designs. Revisiting Castells' network metaphor, creating network is key to influence global social and economic activities. According to Castells, network economy consists of "segments of firms, segments of governments and segments of public sectors."[41] Huawei benefits from endeavors of the Chinese government. In 2019, China Unicorn, one of the three telecom companies of China, expressed its commitment to build 5G infrastructure across Belt and Road route.[42] China Unicorn's this involvement could not be made independent of the Chinese government. This will help Huawei to lower its costs in spreading 5G technology. Thus, for a particular aim of establishing 5G networks, Huawei, the Chinese government and other companies form units as networks with the participation other local companies.

Yet, Huawei is a private company. Despite Huawei's adherence to China's strategic plans and its founder' military background, there is no organic connection between Huawei and the Chinese government. In its official website, it is stated that Huawei is owned by approximately 100.000 employee. The founder Ren Zhengfei only owns 1 percent of the company.[43] Nolan claims that had Huawei been a state company, it would have entered into rent-seeking contracts relying on political relationships. The state ownership led many Chinese companies away from investment in their core businesses and competition with global giants. Ren Zhengfei comments that: "If the government had given Huawei the right to develop the Beijing-Guangzhou railway, Huawei would have left the telecoms equipment business."[44] Although Huawei acts in accordance with the Chinese state's grand designs, it is not a part of the state structure. Huawei received no diplomatic support until it became a

[39] *Huawei Investment & Holding Co., Ltd. 2019 Annual Report*, (Huawei, 2020), 1.
[40] Fengru and Guitang, *Global Value Chains and Production Networks Case Studies of Siemens and Huawei*, 132.
[41] Castells, "The Contours of the Network Society," 154.
[42] Jeff Pao, "China Unicom to Build 5G Networks on Belt and Road," *Asia Times*, (2019), https://asiatimes.com/2019/06/china-unicom-to-build-5g-networks-on-belt-and-road/ (24.05.2020).
[43] "The Early Years,",*Huawei*.
[44] Peter Nolan, "Globalisation and Industrial Policy: The Case of China," *The World Economy* (2014): 759.

significant brand of China's technological prowess in 2000s.[45] This indicates China eschewed acts to strengthen Huawei until Huawei gained a considerable degree of competitiveness in the global market. Thus, China acts more like a facilitator of Huawei's expansion into the global market instead of its director.

By inserting itself into networks through private companies, China gains influence and power. The official document, which lists the Communist Party's prerogative, states that adapting changes brought by globalization and coordinating the elements of globalization drive China at the center of global stage.[46] This statement is in congruence with Kratochwil's assessment. The penetration into global markets is possible through giving up the assertion of creating a world empire and embracing economic networks.[47] This assertion can be applied to the operationalization of 5G network. Instead of creating 5G networks itself, China allowed Huawei to invest into R&D and to penetrate into the global markets, ensuring its activities remain in conformity with its main goals, which aimed at elevating China's standing in the world. This challenge posed by China raises concerns of its main competitor, the USA regarding the role of Huawei.

4. US Restrictions on Huawei

Almost 80 percent of global 5G market is dominated by three big companies. The market share of Huawei is 30 percent, whereas the market share of Ericsson is 26 percent, and the market share of Nokia is 22 percent.[48] Huawei is also leading the development of 5G technology. 35 percent of the patents related with 5G is owned by Huawei. The USA owns less than 5 percent of the patents.[49] The domination of Huawei in 5G market is, therefore, considered as a threat by U.S. government. Security, economic, and systemic considerations constitute the main pillars of U.S. fear concerning Huawei. Huawei's reach to the security infrastructures is the source of security concerns. U.S. government fears that Huawei could be used for espionage purposes in the name of China. Economically, Huawei is alleged to benefit from unfair trade conditions and China's political leverage; thus, according to U.S. government officials U.S. companies should be shielded from Huawei's predatory market

[45] Nolan, "Globalisation and Industrial Policy: The Case of China," 759.
[46] "Seeking Common Ground for the World-How Did China Approach the Center of the World Stage?," *Xinhuanet*, (2019), http://www.xinhuanet.com/silkroad/2019-08/13/c_1124867801.htm (02.06.2020).
[47] Friedrich Kratochwil, "Of Systems, Boundaries, and Territoriality: An Inquiry into the Formation of the State System,"*World Politics* 39, no.01 (1986): 42.
[48] Xuewu Gu et al., *Geopolitics and Global Race for 5G*, (Bonn: The Center for Global Studies, 2019), 31.
[49] Springbord, *The New Tech War and The Geopolitics of 5G*, 5.

invasion. In terms of systemic concerns, the USA feels that liberal government systems must be defended against China's autocratic influence.[50] These fears are clearly expressed by FBI director Chris Wray. He said that U.S. government is "deeply concerned about the risks of allowing any company or entity that is beholden to foreign governments that don't share our values to gain positions of power inside our telecommunications networks."[51]

The presidential election of 2016 in the USA has been a turning point for U.S.-China relations. During his presidential campaign Donald Trump had complained about trade deficit and had signaled a rise of tariffs between the USA and China to remedy it. After Trump became the President of the USA, the world witnessed an increasing tariff war between the USA and China especially after 2018. [52] Huawei was also targeted by the Trump administration in the framework of strained U.S.-China relations. In May 2019, Donald Trump blacklisted Huawei in US market. Other technological companies located in the USA backed the administration's decision. Google restricted Huawei made smart phones' reach to its applications such as Google maps or Gmail. Intel, Broadcom, and Qualcomm cut their ties with Huawei.[53]

The USA might have successfully banned Huawei products in domestic market, but the real battleground is Europe. 25 percent of 105 billion income earned by Huawei in 2018 emanates from Europe and Middle East. Huawei ranks third in smartphone market in Europe by holding 18 percent of share.[54] Although Nokia and Ericsson, other companies which invest in the development of 5G, are European companies, their investments legged behind Huawei. In 5G their combined investments in R&D equal Huawei's investment in R&D. Furthermore, the lack of coordination among EU members prevents EU countries from developing a common 5G deployment, creating a suitable environment for Huawei to permeate into European market for 5G networks.[55] The discrepancy between numbers of contracts indicates

[50] Tim Rühlig, John Seaman, and Daniel Voelsen, *5G and the US-China Tech Rivalry-a Test for Europe's Future in the Digital Age*, (Berlin: Stiftung Wissenschaft und Politik, 2019), 2.
[51] James Vincent, "Don't Use Huawei Phones, Say Heads of FBI, CIA, and NSA," *The Verge*, (2018), https://www.theverge.com/2018/2/14/17011246/huawei-phones-safe-us-intelligence-chief-fears (02.06. 2020).
[52] Marianne Schneider-Petsinger and others, *US-China Strategic Competition The Quest for Technological Leadership*, (London: Chatham House, 2019), 6.
[53] Md Sajjad Hosain, "Huawei Ban in the US: Projected Consequences for International Trade," *International Journal of Commerce and Economics* 1, no.2 (2019):22.
[54] *Europe and 5G: The Huawei Case*, (Paris: Institut Montaigne, 2019), 10.
[55] Lorenzo Mariani and Micol Bertolini, *The US–China 5G Contest: Options for Europe*, (Rome: Istituto Affari Internazionali, 2019), 14.

Huawei's increasing presence in the European market. 47 out of 91 total contracts of Huawei based in Europe. Ericsson, on the other hand, has only secured 50 contracts globally.[56]

Hence, U.S. administration concentrated on driving Huawei out of European markets. After the announcement of the ban on Huawei products by the President Trump in the USA, the Department of Commerce placed Huawei on the entity list, which contained the names of companies with which U.S. companies are restricted to make commercial deals. Thus, this act presents foreign companies a dilemma in that they have to choose either doing business with Huawei or severing ties with U.S. companies.[57] The rhetoric of U.S. officials focuses on the security risks of integrating 5G technology into European infrastructure networks.[58] However, instead of security aspect, U.S. attacks on Huawei have been considered as a part of trade war between China-the USA. The heads of the governments of Germany, France, and Netherlands stated that their countries would not bar Huawei from developing 5G networks, pointing out that it would not appropriate to reflect trade war into technology.[59]

Despite this green light to Huawei's activities, the European Commission (EC) published a security guidance for 5G networks. While recognizing that 5G networks in Europe could be threatened by various groups such as individual hackers, state backed actors, or insiders, which provide service 5G networks, but Huawei's name is not mentioned.[60] To address these security risk, the EC calls its members to assess risks and develop appropriate response.[61] The EC recognized the security risks concerning 5G networks but it eschews from identifying specifically Huawei as a security threat. While leaving decision to allow or ban Huawei in EU members, the EC attempts to pursue a balancing policy between the USA and China. This avoidance of taking responsibility as the highest executive branch of the EU led to fragmentation of response regarding the operations of Huawei in the EU.

Being rebuffed by the Western flank of the EU, the USA concentrated on bringing Central and Eastern European countries into its anti-Huawei alliance, trying to create a

[56] Daphne Leprince-Ringuet, "5G: Huawei Unveils New Infrastructure Products Aimed at Europe," *ZD Net*, (2019), https://www.zdnet.com/article/5g-huawei-unveils-new-infrastructure-products-aimed-at-europe/ (08.06.2020) .
[57] *Europe and 5G: The Huawei Case*, 18.
[58] Cain Burdeau, "Europe Becomes a Battleground Over Huawei and 5G," *Courthouse News Services*, (2020), https://www.courthousenews.com/europe-becomes-a-battleground-over-huawei-and-5g/ (04.06.2020).
[59] "EU Leaders: We Won't Follow Trump's Huawei Ban," *DW*, (2019), https://www.dw.com/en/eu-leaders-we-wont-follow-trumps-huawei-ban/a-48768000 (04.06.2020).
[60] *EU Coordinated Risk Assessment of the Cybersecurity of 5G Networks,* (Brussels: NIS Cooperation Group, 2019), 13.
[61] *Commission Recommendation,* (Brussels: The European Commission, 2019), 4.

division in the EU. While France, Germany, Italy, Belgium, Austria, Portugal, and Spain allowed Huawei to develop 5G in their countries, Poland, Czechia, and Romania lean towards U.S. position regarding Huawei. Romania objects Huawei's participation as China does not share transatlantic values such as respecting human rights or implementing democracy.[62] In Czechia, Huawei's presence has also been threatened as a result of U.S. pressure. In December 2019, the directive prepared by Czechia's cybersecurity agency warned that Huawei's participation in 5G networks presents security threat.[63] In May 2020, the USA and Czechia signed an agreement in which they agreed to set the security standards for suppliers of 5G.[64] Besides Romania and Czechia, the USA managed to convince Poland regarding Huawei's role in 5G networks. In January 2019, a Chinese employee of Huawei residing in Poland was arrested for espionage charges.[65] October 2019, the USA and Poland signed an agreement, which requires the suppliers of 5G technology to be given a rigorous security examination such as whether they are being controlled by the foreign government.[66] Although Huawei is not named directly, this article clearly targeted it. This deal could be interpreted as a strong step towards Huawei's exclusion from Poland.

To respond U.S. attacks, Huawei published a document, which answers the allegations raised by U.S. State Department. It denies U.S. claims such as Huawei is subsidized by the Chinese government and it engages in intellectual theft. The most striking part of the document, however, Huawei's response to U.S. claim that Huawei does not share Western values. The document states that Huawei respects security and protection of privacy as much as American citizens do and perhaps more than U.S. government does, reminding Edward Snowden's revelations concerning monitoring of European leaders' phone calls by the National Security Agency (NSA) of the USA.[67] It also warns countries about the rising costs and delays in 5G development, should Huawei is banned. The document uses Oxford

[62] "Out of Step Romania's Foreign Policy and the Huawei 5G Case," *Visegrad Insight*, (2020), https://visegradinsight.eu/romania-out-of-stop-5g-china/ (12.06..2020).
[63] Marc Santora and Hana de Goeij, "Huawei Was a Czech Favorite. Now? It's a National Security Threat," *The New York Times*, (2020), https://www.nytimes.com/2019/02/12/world/europe/czech-republic-huawei.html (11.06.2020).
[64] Kelsey Warner, "US Signs Deal with Czech Republic to Safeguard Future of 5G Networks," (2020), https://www.thenational.ae/world/the-americas/us-signs-deal-with-czech-republic-to-safeguard-future-of-5g-networks-1.1016365 (11.06.2020).
[65] "How Poland Became a Front in the Cold War between the U.S. and China," *Reuters*, (2019), https://www.reuters.com/investigates/special-report/huawei-poland-spying/ (10.06.2020).
[66] Justin Sink and Alyza Sebenius, "U.S. and Poland Ink 5G Security Agreement Amid Anti-Huawei Campaign," *Bloomberg*, (2019), https://www.bloomberg.com/news/articles/2019-09-02/u-s-poland-ink-5g-security-agreement-amid-anti-huawei-campaign (10.06.2020).
[67] *5G Security Huawei: Facts, Not Myths*, (Huawei, 2020), 3.

Economics prediction that the exclusion of Huawei could increase the country's costs 8 percent to 30 percent in a decade.[68] This implicit threat has worked in Poland. Despite the security arrangements with the USA, a minister in Polish government pointed out the impossibility of excluding Huawei completely. In May 2020, the mobile operator Plus with the partnership with Huawei launched Poland's first 5G network.[69] Huawei also resorts to using China's economic leverages when it faces problems. After being directly identified as a security threat in Czechia, Huawei threatened to sue the relevant government department and to retaliate economically, which alarmed businessmen and government officials.[70] These cases demonstrate Huawei's resources in dealing with restrictions by the USA. Even though the countries are being pressured by the USA to ban Huawei in their domestic markets, even the closest allies are hesitant to ban Huawei completely either because of the rising costs in developing 5G technology or the unwillingness to jeopardize their economic ties with China. The lack of alternatives in supplying 5G technology strengthens Huawei's hand in quelling suspicions regarding its operations.

While struggling to gather its European partners against Huawei, the USA stepped up its pressure. In May 2020, US Department of Commerce published that the USA would not only bar Huawei from reaching U.S. market but also its foreign suppliers.[71] In the endeavors of restricting Huawei the USA found an unlikely support. In June 2020 the United Kingdom (UK), previously allowed Huawei's 5G operations, announced that it plans to set up a 5G alliance, which will consist of the UK, France, Canada, Italy, Germany, Japan, the USA, South Korea, Australia, and India to create alternative to Huawei in 5G development.[72]

The UK's endeavor is daring as except Australia, the USA, and Japan none of these countries listed to participate in the UK's organization, banned Huawei's 5G operations. Although they expressed concerns about the security of 5G networks, the leading position of Huawei in 5G technology and Huawei's low-cost supply of this technology enabled Huawei

[68] *5G Security Huawei: Facts, Not Myths*, 6.
[69] "First Commercial 5G Network Launched in Poland," (2020), https://notesfrompoland.com/2020/05/12/first-commercial-5g-network-launched-in-poland/ (11.06.2020).
[70] Santora and Goeij, "Huawei Was a Czech Favorite. Now? It's a National Security Threat".
[71] "Commerce Addresses Huawei's Efforts to Undermine Entity List, Restricts Products Designed and Produced with U.S. Technologies," *U.S. Department of Commerce*, (2020), https://www.commerce.gov/news/press-releases/2020/05/commerce-addresses-huaweis-efforts-undermine-entity-list-restricts (10.06.2020).
[72] Justin Sherman, "The UK Is Forging a 5G Club of Democracies to Avoid Reliance on Huawei," *Atlantic Council*, (2020), https://www.atlanticcouncil.org/blogs/new-atlanticist/the-uk-is-forging-a-5g-club-of-democracies-to-avoid-reliance-on-huawei/ (10.06.2020).

to sideline its competitors in providing 5G networks in these countries.[73] Despite the concerns of Huawei's involvement in 5G networks, the benefits of 5G technology cannot be overlooked by these countries. Without offering a viable alternative to Huawei in developing 5G networks, it will be difficult for the USA to convince other countries to join into anti-Huawei alliance.

Besides these elements, China uses economic leverage to support Huawei against countries. In August 2019, China told India that if the activities of Huawei are obstructed, China will sanction the activities of India's companies operating in China.[74] In addition to India, if Huawei encounters restrictions in Germany, China reminded Germany that a quarter of 28 million German cars sold in China, implying it could ban import of German cars.[75] Considering that China threatens to exercise retaliation against Germany and India, which are among the biggest economies, the other countries, which have smaller economies are less resistant to the economic threats of the Chinese government.

The Huawei case, thus, constitutes a new kind of geopolitical confrontation between the USA and China. The access of 5G technology into infrastructure networks will enable Huawei to oversight these networks. U.S. government officials express fears that through Huawei China gain influence in these networks. Fearing the rising Chinese influence, the USA banned Huawei and restricted the access of supplier companies in in its domestic market. However, it fails short in offering alternatives to Huawei, which is the leading investor in R&D in 5G and low-cost supplier of 5G. The European countries shy away restricting Huawei completely. Moreover, the threat of economic retaliation of the Chinese government prevents even the countries, which are sympathetic to U.S. allegations, from taking decisive steps against Huawei.

5. Conclusion

The geopolitical struggle among states has undergone changes as a result of technological developments. Networks, which consists of several interconnected nodes, have become centers where social and economic life occur. Gaining first access to networks and

[73] Sherman, "The UK Is Forging a 5G Club of Democracies to Avoid Reliance on Huawei".
[74] Sanjeev Miglani and Neha Dasgupta, "Exclusive: China Warns India of "reverse Sanctions" If Huawei Is Blocked - Sources," *Reuters*, (2019), https://www.reuters.com/article/us-huawei-india-exclusive/exclusive-china-warns-india-of-reverse-sanctions-if-huawei-is-blocked-sources-idUSKCN1UW1FF (11.06.2020).
[75] "China Threatens Germany with Retaliation If Huawei 5G Is Banned," *The Strait Times*, (2019), https://www.straitstimes.com/world/europe/china-threatens-germany-with-retaliation-if-huawei-5g-is-banned (12.06.2020).

outperforming other players offer enormous advantage for influencing the operationalization of the networks. Thus, the new geopolitical competition takes places on transnational networks instead of fixed territorial units. Power struggle among great powers remain but it metamorphoses.

Today's geopolitical struggle over the networks mainly concentrated on the development of 5G technology. 5G technology introduces leaping changes in economic and social life by providing faster connections in an unprecedented scale in machine-to-machine connectivity and machine-to-human connectivity. From health sector to industrial production almost every sector will be upgraded through 5G networks. It is predicted that 5G networks will unleash fourth industrial revolution. In such an important area, there are three main companies operating: Finland-based Nokia, Sweden-based Ericsson, and China-based Huawei. However, the total investment of Nokia and Ericsson in R&D in 5G hardly correspond Huawei's investment in R&D. These two companies' total contracts in the global markets hardly reach to Huawei's total contracts. This outperformance makes Huawei leading company in 5G development.

Huawei was founded in by a former PLA affiliate Ren Zhengfei. Since its establishment, it expanded into the global market. Although Huawei is a private company with the workers from all around the world, its operations are in conformity with China's grand strategic plans. The recent expansion Huawei was made possible by the Chinese government's two grand initiatives: Made in China 2025 and the Belt and Road Initiative. Made in China 2025 plan prompts the Chinese companies to produce high-value technological products. 5G technology constitutes an important target within this strategic planning. The Belt and Road Initiative, on the other hand, is a project, which aimed at connecting China with the rest of the regions by emphasizing financial, infrastructure, policy, and people-to-people connectivity. Digital connectivity is one of the components of the project. By laying out fiber optic cable networks the digital infrastructure of the participant countries is being strengthened. Utilizing these fiber optic cable networks Huawei is able to penetrate 5G networks of Belt and Road's participant countries.

Being sidelined in the development of 5G network, the USA sough to restrict Huawei's access to the global market. In May 2019, the President Trump banned Huawei in U.S. domestic markets. Then, the Trump administration focused on pressuring the European

countries to expel Huawei. Despite security warnings and explicit threats to ban the companies, which establish partnership with Huawei from U.S. markets, the European countries continued to allow Huawei in developing 5G technology in their countries except few exceptions such as Romania and Poland. Even these countries are hesitant to block Huawei completely due to the fear of the reprisals of the Chinese government. Globally, the USA only fully convinced Australia and Japan not to include Huawei in their 5G development plans.

So far, the USA could not prevent Huawei's participation into 5G networks. Being surpassed in 5G development, the USA does not offer a cheap and feasible alternative to China-based Huawei. Hence, despite security concerns due to Huawei's affiliation with the Chinese government, the countries continue to grant contracts to Huawei in upgrading 5G technology. U.S. policymakers should, therefore, focus on creating viable 5G alternative by investing other companies' 5G development efforts to counter Huawei's dominance in the market. Instead of stressing threats that Huawei has posed in 5G development more emphasis on U.S. contribution on the development of 5G networks will be more helpful in enabling the USA to change the positions of its allies in Europe regarding 5G technology. The EU, on the other hand, could not develop a coherent EU policy regarding 5G; thus, Europe remains a battleground for China and the USA for the development of 5G networks instead of an important player. The European Commission, as an executive organ of the EU, should take more bold steps in developing and enforcing a common European response would strengthen EU's position vis-à-vis China and the USA.

As stated above, 5G technology has broad consequences for people's lives and policymakers. When today's predictions turn into reality in future, the wider implications of 5G will be appreciated adequately. As the development of 5G brings about cooperation and competition of nation-states, multinational companies, regional bodies, it leads to the establishment of networks comprised of all these actors. Articulation of new geopolitical maps, which show these networks depending on the preference of 5G networks, will be just one of the consequences of 5G technology in social sciences. Thus, it invites further research for social researchers on the level of the interaction of multinational companies and nation-states.

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