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Recently, the development of the technology of the future, 5G network, is having a certain effect on the relations among those countries that joined the race for the leading global position. The major players in this geopolitical, technological, and economic affair are China and the USA, therefore, Europe plays an important role as well. These occurrences may increase not only the strategic suppleness of powers like China, India, the United States, and the European Union, but also the weight of nourishing alignments and fruitful partnerships. This research takes into consideration two fundamental elements to analyze this state of affairs: the economic interdependence between China and the European countries, and the protection of cybersecurity.

Keywords: *5G network, huawei, china, europe, cybersecurity.*

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Recently, the development of the technology of the future, 5G network, is having a certain effect on the relations among those countries that joined the race for the leading global position. The major players in this geopolitical, technological, and economic affair are China and the USA, therefore, Europe plays an important role as well. These occurrences may increase not only the strategic suppleness of powers like China, India, the United States, and the European Union, but also the weight of nourishing alignments and fruitful partnerships. This research takes into consideration two fundamental elements to analyze this state of affairs: the economic interdependence between China and the European countries, and the protection of cybersecurity. The comparative research method and the discourse analysis are employed in this research, conducted examining the recent events (from 2018 to January 2020) and the different approaches of the governments to the new technology.

In sum, through the findings of this research, it can be stated that in Europe, the debates concerning the new technology and its risks are still going on. Still, the economic relations with China aren't affected.

Keywords: 5G network, huawei, china, europe, cybersecurity.

I. Introduction

Implementation of 5G network technology is in its initial phase. However, expectations on a quick advancement of the technology are high, due to its superiority. Verizon® has developed its first 5G network in the USA and made it available for the consumers in April 2019. During implementation, Chinese companies Huawei and ZTE had assumed the leading role by supplying main components, consisting of hardware and software, for the network. *Hongmeng*, a system developed by Huawei, is different from Android, as it is designed for the 4.0 Industry and the Internet of Things (IoT), and the system can be implemented only through the Huawei Core Network. Certainly, the technology of the future will generate profit for the companies that will be able to provide the service, thus, creating competitiveness and a real struggle in the business world. Data from the Ministry of Industry and Information Technology (MIIT) report that the business volume of the telecom sector expanded on 23.9 percent during the January-September 2019 period.

But how the global community is reacting to it? In the Verizon® 5G network case, the United States response was aggressive, and the country blacklisted the Huawei, which resulted in a trade war between the USA and China. Worldwide governments have two opposite tendencies: restricting or accepting Chinese technology; from restricting specific manufacturers (such as in the case of the United States and the Czech Republic), to issuing non-binding guidance (Estonia), or voicing abstention from introducing restrictions. For example, Australia, Japan, and the Czech Republic have proclaimed mandatory security guidance that excludes providers potentially controlled by foreign governments. In Europe two aspects have to be highlighted: from one side, the trade partnership with China (BRI for some actors) and the implications if European countries decide to interrupt the suppliers of 5G based devices from Chinese companies (i.e., Huawei and ZTE); from the other side, pressures from the United States, in particular, regarding the network security.

European countries did not ban 5G, but they are evaluating the risk of cybersecurity, and on 9th of October 2019 the European Commission published an *EU coordinated risk assessment of the cybersecurity of 5G networks*[1], in which the main points are:

- Risks of relevant security gaps, exposure to attacks, as 5G network relies on a software system;
- The presence of more sensitive equipment elements (base stations for example);
- Serious risk of exposure for the profile of individual suppliers;
- Risks due to heavy dependence on suppliers (in the case of possible supply disruption caused, for example, by a commercial failure);
- Threats to network availability and integrity as a crucial security issue;

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[1] Gu, Xuewu and Heidbrink Christiane (2019) 'Geopolitics and the Global Race for 5G', Bonn: Centre for Global Studies, available at http://cgs-bonn.de/5G-Study-2019.pdf pp. 20-31

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It also states that "to complement the Member States' report, the European Cybersecurity Agency is finalizing a specific mapping of the threat landscape for 5G networks, which examines more in detail some technical aspects of the report."

a) Research questions and aims

According to the circumstances described above, the main questions discussed in the present research are two.

First, European countries are reevaluating their economic relations with China because of the 5G affairs, but could not banning the new technology have a risk for the economy of these countries? Also, how can this affect the relations between Europe and China?

Germany, France, Belgium, Great Britain, Norway, and Nederland discussed the ban in Parliament[2] Sweden in public, while Italy, Spain, and Denmark did not consider a ban. In particular, the author has analyzed the evolution of events in Italy. In March 2019, Italy adhered to the Belt and Road Initiative, reinforcing its economic partnership with China, initially in a Memorandum of Understanding, that the two countries signed on 23rd of March 2019. However, the strategy about 5G was not clarified, but later the government of "Conte-bis" proposed to extend the Golden power law to the new network.

The second enquiry is related to the importance of safeguarding the cybersecurity. The main reason behind the skepticism of Western countries on the Chinese way of controlling the data of clients is the Chinese and Western approaches to individual rights. The EU strictly stands on protecting individual privacy and restricts mass surveillance (as evident through the implementation of the General Data Protection Regulation 'GDPR' and in recent landmark judgments by the European Court of Justice). The EU and the United States have steady intellectual property protection regimes, while Chinese national policy favors state interests over private ones. Within domestic affairs, China's sovereign authority is free to impose obligations on its industry, including for intelligence collaboration. On the other side of the coin, according to the WTO General Agreement on Tariffs and Trade (GATT), the Western states are in principle free to ban Chinese products, while respecting their obligations under international trade arrangements. A security exception of article XXI of the WTO GATT authorizes a party to take action or measures, "which it considers necessary for the protection of its essential security interests." The EU public procurement Directive 2014/24/EU in general and the electronic communications Directive 2002/21/EC, which addresses the operation of communications networks and the awarding of radio spectrum licenses, including 5G, comprise exceptions allowing each member state "to take the necessary measures to ensure the protection of its essential security interests, to safeguard public policy and public security."

The present research aims at analyzing the recent events related to the development of the 5G network, how the discussions about the issue of cybersecurity influenced the economic relations between China and the European countries.

II. The Relations between China and the UE under the Framework of the Economic Interdependence Theory

In the last three decades, the deep bilateral trade and economic relations with some of the most advanced and developed European countries brought significant advantages to the economic growth of China. After the recent world recession, China has maintained its position of major partner for many industrialized actors. In the last decade, trades and investments between China and the European Union improved as the interdependence of the two economies has increased. China and the EU are intensely export-oriented, both depending on a growing share of foreign inputs in their exports. Since several manufacturing sectors are interconnected, China and the EU are entwined through an economic partnership, that holds a focal point in the area of imports and exports. Indeed, a relevant share of the exports of each country contains imports from the other country[3]. The manufacturing sector is progressively becoming interdependent.

The global crisis of 2008 has demonstrated how in an increasingly interconnected global economy, the wealth of all countries is interdependent, and trade relations are crucial for the progress of global welfare[4]. In this context, China has remained an important partner for many emerging and industrialized economies. China, as the second-largest world economy, and its increasing assimilation in the global economy over the last three decades are the principal sources of such interdependence. Chinese companies are dynamic actors in a vast number of agricultural, industrial, and services sectors. Nowadays, the current economic rebalancing in China marks an evolution towards a more sustainable and efficient economy, as an essential source for a higher interdependence between China and the rest of the world. Considering Europe, for example, Italy has always been one of the principal trading

[2] The General Agreement on Tariffs and Trade (GATT 1947), Article XXI. World Trade Organisation. https://www.wto.org/english/docs_e/legal_e/gatt47_02_e.htm#articleXXI.

[3] Yang, Y., *China's Integration in the World Economy: implications for developing countries*, Asian Pacific Economic Literature, 20(1), 2006, pp. 40-56.

[4] Echeverri-Gent John, Herlevi April, Ganczak Kim, *Economic Interdependence and Strategic Interest: China, India, and the United States in the New Global Order*, Department of politics, University of Virginia, 2015.

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partners for China, since the two economies disclose several similarities and connections in production structures. In the case of Italy, the economy relies on foreign inputs rooted in production exports in many sectors.

The agroindustry and the pharmaceutical sectors, where the competences, the expertise, and the products of some European countries, such as Italy, can match the growing superiority of Chinese consumers, are presenting new possibilities of economic cooperation.

Moreover, direct investments progressively interconnect the EU and China. In 2015, Europe was the first destination for Chinese outbound direct investments, surpassing North America, thanks also to the large percentage of investments in Italy, the top destination in Europe[4].

China and the EU are gradually collaborating in a number of economic activities, in the goods and services sectors, including food manufacturing. They intend to invest in a more innovative and advanced field, such as healthcare, environmental protection, green farming, industrial upgrading, urban planning, and sustainable development. Their collaboration also includes the sector of technology, specifically through direct investments, that are increasing in the new high-tech areas, such as the 5G network. Chinese companies Huawei and ZTE are major suppliers for the development of the new technology. Thus, it could increase the level of interdependence between the European companies and the Chinese companies. The project of building new economic interdependencies could consent to China and the EU to maintain a leading position in the global economy.

a) *EU-China economic relations: benefits and risks of the 5G network*

The 5G wireless technology is the future of communication. Comparing to the 4G technology, it is 100 times faster, which reduces the response time to 1-10ms. Additionally, the cost per bit is lower and allows transmission of data at 20GB per second or more of speed in comparison to 1GB per second of 4G technology.

The 5G network can efficiently interconnect people, machines, objects, and different devices like industrial robots, security cameras, drones, and automatic cars (remote control of critical infrastructure, vehicles, and medical procedures). It enables a new swing of innovation, improving sectors of technology: Internet of Things (IoT), Artificial Intelligence (AI), Augmented Reality (AR). Consumers would have to buy innovative smartphones to use the new network and get all the benefits from it, including higher-quality streaming video, quicker downloads of full movies in a few seconds, a new generation of video games, virtual sports, and online shopping, etc.

Also, 5G network technology is beneficial for all kinds of industries. Providing the services based upon 5G network technology, telecom operators could benefit globally up to USD 169 billion annually by 2026. There will be a large contribution to the public administration, healthcare, and other sectors. By 2035, the global economic effects of 5G are assessed to be 12 trillion US dollars by 2035, with job vacancies reaching 12 million.

Currently, China's Huawei and ZTE, Sweden's Ericsson and Finland's Nokia provide the specific services for building a 5G Network, while the American Ciscoattivo can furnish only switches and routers. Huawei share in the market is around 30% and provide services at relatively low prices, that's to say that, at the moment, China is the leader of the 5G network technology.

This trillion of US dollar potential market in the networking industry resulted in a competition among countries to occupy a maximum share of it and reinforce their position in the leading global sphere.

According to the data elaborated by the Global System for Mobile Communications (GSMA), telecom operators are investing 160 billion every year to amplify and update their networks, thus employing indirectly 32 million people. In this scenery, China has gained the leading role in 2018, with 1.2 billion users, 8.5 million employees, and an income of 750 billion dollars, 5.5% of the Chinese GDP.

Countries that invest less in the innovation and research field but will use the 5G network should consider effective strategies for building new platforms, otherwise, the procedures would be long and uneven, and it will depend on different factors, including; regulations and norms of the governments, costs and time for building infrastructures, technological experimentations, telecom operators, etc. According to this, for some governments, it will be harder to implement the technology. Some countries are already on the track to regularize the technology and its implementation. For example, the European Union is paying attention to the regulations that control and limit the 5G broadband, as this new technology is using frequencies, which are never used in the mobile network. Currently, China is a model country. The technological innovation and development of the 5G technology infrastructure are the key elements of the political and military power of the country, which is showed in the Digital Silk Road (DSR), one fundamental component of the Belt and Road Initiative (BRI). All the countries involved in the new silk road project have welcomed digital infrastructures, land and submarine cables, vast broadband, and a navigation system called Baidu, which replaces the American GPS. In military technology, 5G and IoT are supporting machine-to-machine communication, thus increasing the quantity of

[5] Amighini, Alessia (2016), *Economic and trade relations between Italy and China: trends and prospects*, ISPI, Milan, pp. 11-20.

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information being communicated. The transmission of information is the fulcrum of the trade war because who controls the data has a big, leading instrument. Therefore, cybersecurity is one of the main aspects while evaluating this new technology for implementation.

b) The blooming of 5G service in China during the fourth semester of 2019

The superfast 5G network service is already available to consumers in 50 Chinese cities with more than 130.000 5G base stations, including Beijing and Shanghai, with monthly plans ranging from 128 yuan ($18) to 599 yuan ($ 85.56), (Xinhua, 2019).

Although the United States and South Korea too launched 5G services in the selected area, China gained more influence over the global evolution of technology. Chinese commercial network is the biggest; Huawei, a smartphone brand based in Shenzhen (Guangdong province) and the world's biggest telecommunications equipment maker, is playing a leading role in this (Bernstein, 2019). "The scale of its network and the price of its 5G services will have a pivotal impact throughout the supply chain,"Bernstein analyst Chris Lane said.

Huawei company does business with all three Chinese telecom operators, and it is the principal vendor of 5G devices. China Mobile, the Chinese largest mobile internet provider, assigned nearly half of its 5G networking contracts to Huawei; the rest went to competitors such as Ericsson, Nokia and ZTE (China Daily, 2019).

The number of mobile internet users in China is higher than in any other country, with about 850 million people. South Korea launched its 5G network in April 2019, and approximately 3% of the country's internet users subscribed to it (Jefferies, 2019).

Chen Zhaoxiong, the vice-minister of industry and information technology, affirmed that China has been working hard to extend 5G coverage. The big three telecom operators - China Mobile, China Unicom, and China Telecom - chose price tariffs by internet speed rather than merely by data allowance alone for the first time.

South Korea, the United States, the United Kingdom, and other countries rolled out 5G networks. Still for Wang Zhiqin, deputy director of the China Academy of Information and Communications Technology (a government think tank), China still leads the world in the scale and diversity of 5G services, with individual consumers and enterprises showing mounting enthusiasm for the new technology.

III. The Reactions of the EU Governments

According to the strategic program of 2020 cooperation between the EU and China, the European Commission shares its interest in a strategic partnership with China. At the same time, China considers the EU as a relevant international actor; in the last twenty years, the trade and economic partnership has increased the exchanges between China and the EU. Therefore, China aims at strengthening cooperation in the sector of infrastructures, in the digital market, and the connectivity between people.

About the digital market, European countries are moving with caution, through the adoption of strategic decisions by specific commissions.

Germany and France benefit from the investments of Huawei; all the telecom operators are using Huawei technology; since Huawei holds numerous licenses, its exclusion could be delaying the development of the digital networks. German wireless network lacks sufficient capacity, so Berlin agreed on collaborating with Huawei, only after granting necessary controls on cybersecurity. In this case, the consequences of a ban could severe on bilateral trades, as China is the largest trading partner of Germany, especially in the car industry. But the priority of Angela Merkel's government is network security.

The head of Germany's Federal Office for Information Security (BSI) in October 2018 noted that introducing a ban on Huawei equipment, there might be evidence of risk. However, in February 2019, Germany required a possible 'no-spy deal' similar to the US-China 2015 agreement.

France also agreed, the normative asset can accurately fix the limits on the new technology. Recently the French government has started the procedure to assign 5G frequency licenses, establishing the price of one segment of 50 MHz at 350 million euro[6].

Huawei and ZTE possess a market share higher than 40% in Europe. Thus, following the direction of the USA banning the two companies might cause huge losses for European Countries, almost 55 billion dollars.

In the case of the USA, trade negotiations between Beijing and Washington reached positive results after long. In June 2019, during the Osaka G20 there was the opportunity for an armistice, nonetheless the break was short: the USA companies again could sell to Huawei, if without risks for the national security, although the Chinese company was still written in the Black List. At the time when the escalation was high with also political and military inclinations, the Chinese think thank proposed to react, bringing back Chinese ambassador from the US.

A preliminary trade deal with China has been finally signed on the 15th of January 2020. The agreement opens the Chinese market to several American companies, increases the export of energy, and farm products, China has agreed to buy more American farm goods, including poultry, beef and soybeans, and provides protection for American technology.

[6] https://www.reuters.com/article/us-france-telecoms-5g/france-launches-procedure-for-5g-licenses-idUSKBN1YL23Z

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China has committed to buy an additional $200 billion worth of American goods and services by 2021 and will ease some of the tariffs it has placed on American products. "Today, we take a momentous step, one that has never been taken before with China toward a future of fair and reciprocal trade with China," Mr. Trump said at a ceremony at the White House. "Together, we are righting the wrongs of the past." [7]

The agreement is a significant turning point in American trade; this pact maintains tariffs forcing China to buy $200 billion worth of specific products within two years rather than lowering costs to permit the flow of goods and services to meet market demand. Previous presidents have tried to change China's economic approach; Trump has leaned into it. The agreement stipulates that "China shall ensure" its purchases could meet the $200 billion figure by 2021, all but guaranteeing an export boom as Mr. Trump heads into the 2020 election. He will proceed to a re-election campaign with China's commitment to reinforce its intellectual-property protections, make sizable acquisitions of American products, and pursue other economic changes that will benefit American business.

President Xi Jinping stated in a message to Mr. Trump that the deal is "beneficial to both China, the U.S. — and the world", the agreement also showed that "the two countries, based on equality and mutual respect, through dialogue and consultations, can find proper and effective solutions to problems."

a) The concern about cybersecurity

The main reason behind Trump's trade war was cybersecurity: unauthorized transmission or modification of data, acquisition of personal data through machine learning, telephone tapping, identity theft, fraud. The data transmitted could also be private, related to the health conditions, to the financial status, and, furthermore, to the political tendencies of users. The last one could be very harmful to democratic systems that alarmed European countries. Having such kind of data could have enormous commercial and political advantages.

In China, the anti-spy law of 2014 and the law on the national intelligence of 2016 imposed to citizens and companies to collaborate with the intelligence, in order "to support, provide assistance, and cooperate in the intelligence work, and guard the secrecy of any national intelligence work that they are aware of. The state shall protect individuals and organizations that support, cooperate with, and collaborate in national intelligence work" [8]. "Relevant organizations and individuals" must provide information, facilities, or other assistance, and "must not refuse" cooperation [9].

What alarmed more President Trump was the suspect of a 'backdoor' in the network that could divert the national security checks stealing political, economic, and financial data. With no proves the US accused Huawei of using this technology, without evidence, Beijing denied, clarifying that the government never asked the company to install this kind of technology. Huawei replied that it was a way to slow down the technological race and reassured its European partners, opening at Brussels a cybersecurity transparency center (already present in Oxfordshire and at Bonn) the 5th of March 2019.

The risk is not unfounded, but comes from the nature itself of the 5G network, able to manage many devices IoT, like also a virtual machine, healthcare devices, drones, and digital cameras for surveillance and industrial automated systems, in this case, the network's surface is broader and easy to attack.

In 2015 China and the EU signed a cooperation act, *5G Action* Plan[10], on research and standardization, to launch the 5G services in all the EU Member States by the end of 2020. On the 9th of October 2019, the European Commission published an *EU coordinated risk assessment of the cybersecurity of 5G networks*. It seems that some European countries are looking for other suppliers: Deutsche Telekom was reconsidering its vendor strategy; Orange (previously France Telecom) probably would not use Huawei devices. Also, the UK's leading telecommunications operator, BT group, is considering abandoning Huawei devices (existing 3G and 4G, and new 5G).

[7] Swanson, Ana, and Rappeport Alan (2020) Trump Signs China Trade Deal: Putting Economic Conflict on Pause The New York Times, 2020/01/15https://www.nytimes.com/2020/01/15/business/economy/china-trade-deal.html

[8] Most countries lack specific transparency and accountability mechanisms over Huawei operations. The UK Huawei Cyber Security Evaluation Centre (HCSEC), with its dedicated oversight board controlled by the UK cyber security authority NCSC and reporting to GCHQ, the UK intelligence and security agency, is so far unique in its model of operation. (The recent entities Cyber Security Evaluation Centre set up in Germany and Belgium lack a similar oversight arrangement.)

[9] Hoffman, Samantha and Kania Elsa (2018) Huawei and the ambiguity of China's intelligence and counter-espionage laws, The Strategist, Australian Strategic Policy Institute, https://www.aspistrategist.org.au/huawei-and-the-ambiguity-of-chinas-intelligence-and-counter-espionage-laws/

[10] '5G for Europe Action Plan', European Commission, Policy, 19th December2019, available at https://ec.europa.eu/digital-single-market/en/5g-europe-action-plan

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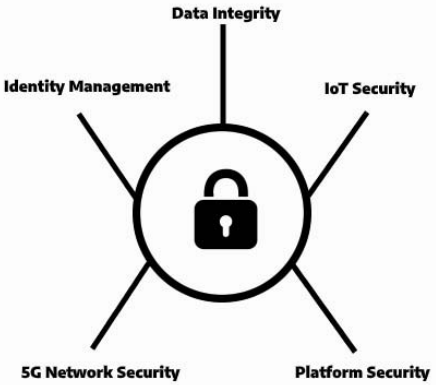


Figure 1: Security areas

Initially, some countries were favorable to ban the new technology because it was considered potentially harmful to human health. However, some research institutes deny this possibility: in Italy, the National Health Institute has proved that 5G antennas are safer; the French agency for safety, health, and environment has demonstrated that the 5G electromagnetic waves penetration is less relevant than 2G, 3G, and 4G. But in some areas those studies don't convince the authority, that are still sceptic about the effects on human health; this is the case of a town in Italy, Scanzano Jonico (Matera, Basilicata region), that refused to build infrastructures for the new technology within the territory of the town[11].

As said before, through the 5G technology, the transmission of information and data is quicker and wider. Therefore, a system of regulations and norms aimed at reducing the threats to cybersecurity and the violation of privacy is necessary. Considering the European Union, the European Commission should pay attention to this. On 26th of March 2019, the Commission requested to send to the ENISA (European Union Agency for Cybersecurity) an evaluation on risks and necessary measures for the integrity and the security of every country, and a group of cooperation would work on the possible solutions. It is essential to elaborate European certification schemes that guarantee minimum common standards, as established by the Cybersecurity Act on the 12th of March 2019. These common standards could be essential since third partners as China or the USA still don't have regulations on the 5G technology. Huawei is not furnishing the core network for the transmission of all the sensitive information of the European governments.

Huawei cybersecurity centers in the UK and Germany are examples of Huawei's intention to cooperate. The UK cybersecurity authority NCSC (part of the UK intelligence and security agency GCHQ) controls the Huawei Cyber Security Evaluation Centre (HCSEC), set up in 2010 that produces regular reports of its discoveries. A similar center was founded in Germany in November 2018 and in March 2019 the EU CyberSecurity Transparency Centre has been set up in Brussels. Huawei plans to establish a similar one in Poland. These measures for protecting the cybersecurity might be not so affordable and too expensive for small European countries.

On the 1st of October 2020, EU Member States, in cooperation with the Commission, have assessed the effects of the *risk assessment*'s report to determine whether further action is needed, taking into account the effectiveness of the measures. On the 31st of December 2019, the Cooperation Group of the European Union had agreed on several mitigation measures to address the cybersecurity risks identified.

Europe is the second market for Huawei, for Ren Zhengfei Europe should not reply to the pressures of Trump, because "once the USA has found an agreement with China and consequently Huawei, won't care anymore about its allies"[12].

Regarding the economic relations, data published by the General Administration of Customs of the People Republic of China (see table 2)[13] report that

[11] Del Frate, Claudio (2019) 'Scanzano Jonico vieta il 5G: «È pericoloso per la salute»', Corriere della Sera, available at https://www.corriere.it/cronache/19_agosto_03/scanzano-jonico-vieta-5g-pericoloso-la-salute-3a6d5e3e-b5cf-11e9-936f5597e95c0cf4_preview.shtml?reason=unauthenticated&cat=1&cid=dbSmfzVe&pids=FR&credits=1&origin=https%3A%2F%2Fwww.corriere.it%2Fcronache%2F19_agosto_03%2Fscanzano-jonico-vieta-5g-pericoloso-la-salute-3a6d 5e3e-b5cf-11e9-936f-5597e95c0cf4.shtml

[12] Savelli, Fabio (2019) Huawei, parla Ren Zhengfei: «Le spie? Gli Usa. Europa e Cina mercati complementari»', Il Corriere della Sera, available at https://www.corriere.it/economia/aziende/19_luglio_2019/huavwei-parla-ren-zhengfei-le-spie-theUSA-europa-cina-mercati-complementari-02130cee-aca3-11e9-8470-d02c1b58748e.shtml)

[13] China Customs statistics are the official external merchandise trade statistics of the country. China Customs is responsible for trade data collection, processing, compilation, and publication. By adopting

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commercial trades between China and the European Union regularly remain, except for the imports rage of Netherlands, as compared to the numbers of import and export between China and the US that decrease drastically since the Trade war started.

Table 1: Source: General Administration of Customs of the People Republic of China

China's Total Export & Import Values, September 2019 (in CNY)									
Unit: CNY 100 Million									
Import Source	Export & Import		Export		Import		1 to 9 Total Year-on-Year (±%)		
Export Destination	9*	1 to 9 in Total	9	1 to 9 in Total	9	1 to 9 in Total	Export & Import	Export	Import
European Union	4,251.4	35,730.4	2,627.2	21,665.1	1,624.2	14,065.2	8.6	10.7	5.5
Incl: Germany	1,089.6	9,463.1	453.6	4,048.5	636.0	5,414.7	5.7	9.4	3.1
Netherlands	521.3	4,176.2	457.9	3,628.3	63.4	547.9	3.1	5.4	-10.0
United Kingdom	594.0	4,363.5	447.1	3,166.4	147.0	1,197.1	14.4	18.3	5.1
France	375.2	3,271.8	194.0	1,661.7	181.2	1,610.1	10.4	11.9	9.0
Italy	331.6	2,806.4	204.6	1,712.0	126.9	1,094.4	5.6	6.7	3.8
United States	3,299.8	27,531.3	2,555.4	21,337.1	744.4	6,194.2	-10.3	-6.0	-22.5

**the table also included other countries like Australia, Japan, South Africa, etc.*

IV. The Concern Around the Cybersecurity in Italy: Issues and Solutions

This chapter analyzes the situation of one European country, Italy: how the Italian government is developing the 5G network searching for solutions to guarantee the protection of national security and cybersecurity.

In Italy Huawei had signed contracts with Enel, Fastweb, Ferrovie dello Stato, Telecom, Poste Italiane and others, it also manages different research and innovation centers, in the new Microelectronics Innovation Lab at Pavia Huawei has invested 1.7 billion dollars and in the Joint Innovation center at Pula 20 million, and has authorized commissions with Vodafone and Tim (Italian telecom operators). The project of the company is to invest 3.1 billion dollars in Italy for research within the next three years, innovation, infrastructures and marketing, creating 3000 job places. In the area Bari-Matera (Puglia-Basilicata regions) has invested 60 million euros, and there will be full network coverage by 2020. Thomas Miao, chief executive of Huawei in Italy, defined the Italian approach to 5G network as an example for the other European countries[14].

ZTE also had signed relevant commissions with Wind and Tre (Italian telecom operators), the sales volume of 2017 was of 14 billion euros. In the Abruzzo region, ZTE has opened a 5G center of Innovation and Research.

5G arrived in Italy in June 2019, Vodafone, the telco owned by UK telecommunications group Vodafone Group, was the first telecom company to offer the service in 5 cities: Milan, Turin, Bologna, Rome, and Naples, using equipment from Nokia and Huawei for the development of commercial 5G.

When Vodafone started launching the service, the company expected to cover around 45 to 50 cities during 2020. By 2021 rival operator Telecom Italia (TIM) also plans to provide 5G coverage for 245 industrial districts, 30 tourist destinations throughout Italy, and 50 industrial districts. By 2021 the new technology will reach 100 Italian cities and the main touristic sites.

In 2018, Ministry of Economic Development in Italy announced the completion of the national 5G spectrum tender, in which the government raised a total of EUR 6.55 billion, currently $7.36 billion (5G licenses are valid for 19 years, except the authorizations in the 700 MHz band, which will not be released until 2022 and will be valid for 15 and a half years).

The Italian government had chosen to extend the *Golden power* law (verify the security of the extra-UE vendors) as a strategy for the protection of national security also entrusting the government to react against improper use of data. Now the Italian companies have ten days, after the stipulation of an agreement with non-European countries, to notify to the premiership a detailed report, to "allow the veto exercises or the imposition of particular prescriptions or conditions." For

standard concepts and definitions recommended by the United Nations for use in the international trade statistics, China Customs figures are comprehensive, reliable, and internationally comparable.

[14] Fiordalisi, Mila (2019) 'Golden Power, approvato il decreto legge per la sicurezza del 5G', CORCOM, available at https://www.corriere comunicazioni.it/telco/5g/golden-power-approvato-il-decreto-legge-a-tutela-del-5g/

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example, Fastweb alerted its agreement with ZTE for the acquirement of devices for realizing the last segment of the 5G network (mobile and landline). Wind Tre notified its pacts with Huawei also related to the acquisition of equipment for building electronic communication networks based on 5G. The Italian Government had also established a Centre of Evaluation and National Certification (CVCN)[15].

a) The economic relations between China and Italy

The 13th point of the *Memorandum of Understanding* explains the importance of having a mutual benefit economic partnership between China and Italy with advantages and profits for both countries.

"13. The Parties underline the continued growth of bilateral trade and investments in both directions and reiterate that, to strengthen bilateral trade cooperation and mutual investment between the two countries, it is necessary to ensure a level playing field and promote full protection of property Intellectual. The Parties also agree on the need for wider and easier access to their respective markets, including the aim of achieving the common goal of a gradual rebalancing of bilateral trade. In this direction, the Parties will continue to use all bilateral mechanisms of dialogue and consultation, such as the Committee Government, the Joint Commission, the Business Forum Italy–China, and, on the Italian side, Italy-China Task Force set up at the Ministry of the Economic Development Republic of Italy. The Parties confirm Italy's participation as a country guest of honor at the second edition of the China International Import Expo. The Parties also want the definition of Mutual Recognition Agreement driver's licenses for conversion purposes."

Every week in both countries, there are events to promote the Chinese economy in Italy and the Italian economy in China. Italian entrepreneurs, researchers, and institutional managers participated in the edition of China-Italy Innovation, Science and Technology Week in the cities of Beijing and Jinan from 28th to 31st October 2019. Thematic seminars, networking tables, one-to-one meetings, and intensive institutional promotion marked, under the auspices of their respective governments, the pace of the bilateral cooperation program launched ten years ago between Italy and China with the aim of innovative research and enterprise systems. In the CIIE (Shanghai International Import Expo 5-10 November 2019) the Italian booth was one of the biggest, in that occasion China conferred to Italy a privileged position, it was a successful opportunity – as seen in the previous 2018 edition – for Italian companies to showcase the quality of Made in Italy's products and services. The exhibition for Italian companies extended to 6,900 square meters and touched more sectors.

The uncertainty veil around Huawei did not compromise the economic relations between Italy and China; in 2019, exports to Italy in China increased to 3153800 USD THO in December from 2615265 USD THO in November of 2019.

V. Summary

The affair is still under discussion; thus, the findings of this research could not head to a final prediction of future events.

In the technological race, China holds leadership with Huawei and ZTE. For some Chinese scholars, the USA probably tried to stop it with ban, penalties; the sanctions were never entirely employed not to encounter retaliations, besides, there was no public evidence of technological risks in Huawei and ZTE equipment. A concern persists because purchasing the technology of a specific vendor creates a level of dependence: it involves a long-term commitment to a partnership with a supplier. The hub of the Huawei dilemma is mostly about its credibility and liability. The concern related to cyber espionage remains. For Chinese companies, it is mandatory by law to cooperate with their government supporting Chinese national interests; this includes participation in intelligence activities. It also shows a different approach from that of Western countries on the interdependence and interaction between the government and industry. There are several examples of employing private actors in favor of economic espionage and influence activities for the interests of the government.

Moreover, all the countries involved in the Chinese Belt and Road Initiative are giving priority to the development of infrastructures, including the new network technology, so the USA, stepping down, take into consideration the current geopolitical context.

In Europe, the governments are still analyzing the risks of this new technology and they are debating to proceed towards the preservation of good economic relations between Europe and China.

Among the European countries, Italy has given a model, with a strategy on how to limit the risks for the cybersecurity through the *golden power* law. Considering that in 2020 China and Italy are celebrating 50 years of friendship, their partnership will soon run fast with benefits for both sides. Thus, regarding the new technology affair, there were not negative implications on China-Italy economic partnership.

Definitely, the topic is multifaceted since it affects the national security, the economic, technological spheres, and the dimension of international relations, so, notwithstanding countries

[15] *Comunicato congiunto tra la Repubblica Italiana e la Repubblica Popolare Cinese sul rafforzamento del partenariato strategico globale*, 23 marzo 2019, Roma. http://www.governo.it/sites/governo.it/files/ComunicatoCongiunto_Italia-Cina_20190323.pdf

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signed agreements and are trying to cooperate, the path towards a trustful economic collaboration between Europe and China is still long, but, hopefully with less competition and more cooperation.

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