



THE UNSEEN FACE OF TRADE WARS: U.S. - CHINA TECHNOLOGY COMPETITION

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ABSTRACT

Purpose- The main pillars, strategies and future perspective of the technological cold war between the United States and China are the subject of analysis of this article.

Methodology- The study analyzes the future of technology wars between the U.S. and China, the repercussions on global markets, and the effects of diplomatic developments on the economy of the country.

Findings- Donald Trump has stated that under Chinese law, foreign companies can enter the Chinese market only by forming joint ventures with local parties, adding that this requirement allows Chinese companies to access the technologies of their U.S. partners. China now holds a very important place in the global production chain.

Conclusion- China, which has changed its economic approach from labor-intensive production to technology-intensive production, aims to escape the middle income trap by exporting high value-added technological products. Falling behind China in production, the U.S. is trying to prevent a competition that China will become even more prominent thanks to its 5G technology, and to delay it where it can't prevent it.

Keywords: China, U.S., trade wars, technology, 5G.

JEL Codes: E00, F00, F50.

1. INTRODUCTION

In November 2018, U.S. Vice President Mike Pence called for "China not to gain entry to the world's most advanced sectors, including robotics, biotechnology and artificial intelligence." This situation, referred to as the 'Cold War' between the U.S. and China, has led to controversy on the technology axis which is the driving force of the 21st century economy. Since then, the representatives of the U.S. and China have engaged in intense negotiations for a possible deal with the aim of stopping the escalation of the trade war. The resolute attitude of Chinese officials, who understood the intent of the U.S. demanding that China effectively eliminate its high-tech manufacturing sector, led to a disagreement and not reaching a clear conclusion in negotiation process. Seeking to take China out of the technological equation, in 2018 the Trump administration shortened the visa duration of Chinese graduate students who study in areas such as robotics, aviation and high-tech manufacturing and then return to their country.

The three largest monopoly market shares in the mobile phone market are respectively Samsung, Huawei and Apple. On May 14, 2019, Donald Trump declared a state of national emergency in an attempt to protect the telecommunication network of the United States. Although the national emergency decree did not point out a clear address, it soon became clear that what was meant was China and the Chinese company Huawei.

Technology war between USA and China, changes in technology infrastructure of these countries, smartphone market, figures, strategies and future scenarios were analyzed in detail. In this article, the transformation in the Chinese economy, trade and technology wars between the United States and China, future projections are discussed.

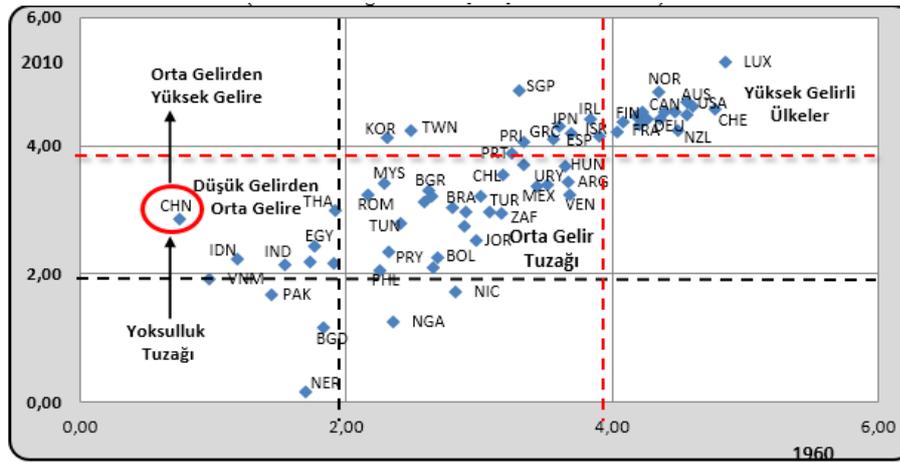
2. TRANSFORMATION OF CHINA'S ECONOMY

The report titled "the Crescent and the Dragon in the Asian Century", published at the end of 2016, by Foreign Economic Relations Board (DEİK) stated that "China's economy is shifting from labor-intensive and low-tech manufacturing to capital-intensity. Having invested over 350 billion dollars in R & D activities in 2015, China is one of the most invested countries in this area in the world, also it has become the country where the most patents have been obtained by getting ahead of the United States." (<https://www.deik.org.tr/uploads/cin-raporu-2.pdf>: 3-4)

As stated in the DEİK report, the foundation of this process was laid in the 13th Five-Year Development Plan of China which covers the period 2016-2020. In the 13th Five-Year Development Plan, China moved from a growth model based on low-cost exports and heavy industry to a growth model focused on high value added and industrial investments.

The driving force of the transformation process specified in the 13th Five-Year Development Plan is designated as "Made in China 2025". "Made in China 2025" is a vision of an innovation-based economy that China has implemented in order to survive the middle income trap and maintain its competitiveness on a global scale. China, which has been growing in double digits for many years, has moved from a low-income country to a middle-income country with its growth performance, as shown in Figure 1.

Figure 1: Economic Development Patterns in the World Economy (1960-2010 Logarithmic Per Capita/ABD=100)



Source: Tuncel C.O (2014)

In China, the transfer of resources between conventional and modern sectors has slowed down, the rural workforce has decreased, and wage levels have increased in urban areas, although today's figures show that growth has slowed down compared to previous years' performance. All these developments have also slowed down the productivity growth in the economy. The only way out of the Middle Income Trap is to become a country that can produce technology. The main goal of "Made in China 2025" project is to move China back into a "High-income Country" level. (Çin'in Orta Gelir Tuzağından Çıkışında "Made in China 2025" Stratejisinin Önemi, <http://criturk.com/haber/ozel-haber/cinin-orta-gelir-tuzagindan-cikisinda-made-in-china-2025-stratejisinin-onemi-19437>)

"Made in China 2025" is the Chinese version of the German "Industry 4.0" project. China, which has set its target as being a technology center, it aims to turn into a technological superpower at the latest 100th anniversary. "Made in China 2025" plan includes reforms in 8 areas. These areas; (Çin'in Orta Gelir Tuzağından Çıkışında "Made in China 2025" Stratejisinin Önemi, <http://criturk.com/haber/ozel-haber/cinin-orta-gelir-tuzagindan-cikisinda-made-in-china-2025-stratejisinin-onemi-19437>)

- Intensifying reforms in systems and mechanisms
- Creating a market environment in a fair competitive environment
- Improving financial subvention policies
- Strengthening subventions which are based on fiscal and tax policy
- Perfecting multilayered staff training systems
- Improving policies for small and medium-sized enterprises (SMEs)
- Increase in export expansion in manufacturing industry
- Developing organizational implementation mechanisms

In "Made in China 2025" plan, 10 sectors are identified as priorities. These sectors are as follows (Çin'in Orta Gelir Tuzağından Çıkışında "Made in China 2025" Stratejisinin Önemi, <http://criturk.com/haber/ozel-haber/cinin-orta-gelir-tuzagindan-cikisinda-made-in-china-2025-stratejisinin-onemi-19437>)

- New Advanced Information Technology
- State-of-the-art Digital Control Machine Tools And Robots
- Aviation Equipment
- Marine Engineering and Advanced Technology Ships
- Transport Equipment of Modern Railways
- Energy Saving and New Energy Tools
- Electrical Equipment
- New Materials
- Biopharmacology and High Performance Medical Devices
- Agricultural Machinery

Within the framework of the 13th Five-Year Development Plan, it is foreseen that 40% of basic components and materials will be manufactured domestically by 2020 and this rate will be increased to 70% by 2025 . It is aimed to reduce operating costs, production cycles and product defect rates by 30% by 2020 and to increase this rate to 50% by 2025. It is planned to establish 15 innovation centers by 2020 and increase this number to 40 by 2025 . (Çin'in Orta Gelir Tuzağından Çıkışında "Made in China 2025" Stratejisinin Önemi, <http://criturk.com/haber/ozel-haber/cinin-orta-gelir-tuzagindan-cikisinda-made-in-china-2025-stratejisinin-onemi-19437>)

3. UNITED STATES - CHINA WARS

The trade wars between the United States and China began on March 1, 2018, when President of the United States, Donald Trump announced that he would begin imposing a 25% customs duty on steel imports and 10% on aluminum imports. The issue of innovation comes to the fore in the trade wars between the United States and China. While the United States is concerned about losing its superiority in the field of innovation, China states that the United States is impeding China's efforts by imposing sanctions on areas such as aerospace, telecommunications and artificial intelligence. (ABD-Çin ticaret savaşı, <https://tr.sputniknews.com/trend/abd-cin-ticaret-savasi-gumruk-vergisi-ithalat-ihracat/>)

Chinese publication organization "Global Times" said; "China doesn't want to get into a trade war." regarding the trade wars. However, their expression of "If the Trump government wants to curb China's high-tech development and marginalize its high-tech industry, the issue will gain another dimension," reveals that technological competition is at the crux of this battle. (ABD'den Çin Mallarına Ek Gümrük Vergileri, <https://siyasetdergisi.com.tr/abdden-cin-mallarina-ek-gumruk-vergileri/>)

On May 10, 2019, the United States increased its customs duty rate on Chinese products from 10% to 25%, hitting technology products, mainly smartphones and computers the most. According to 2018 data, the United States imports 539 billion dollars from China and imports mobile phones and similar products from China the most. The list of imports includes computers in the second place, telecommunication equipment in the third place, computer accessories in the fourth place, and toys and games in the fifth place. 40% of the total value of 140 products imported by the United States from China constitutes the 5 product groups from the technology field. (Apple'ın korktuğu başına geldi! Ticaret savaşı onu sarsacak. (<https://www.haberturk.com/abd-cin-ticaret-savasi-iphone-u-vurabilir-2458672-teknoloji>))

The words 'United States', 'China' and 'Phone' evoke "Apple's iPhone". iPhones made in China are shipped around the world. With a 25% customs tariff, Apple's iPhone production is targeted to be removed from China. While China is advantageous in terms of production costs, Apple has considered focusing on China only in assembly, giving other countries a place in the production of iPhone components.

From the Chinese perspective, "Designed by Apple in California. Assembled in China" phrase has been replaced with the phrase of "Designed and assembled in China" with the increasing technological breakthroughs. Chinese brands have started to introduce their own original products to the market, instead of counterfeit products. Chinese companies, which did not find themselves on the list of the 21 largest technology companies in the world in previous years, are now on the list with 9 companies, according to recently announced data. The other 12 companies on the list are United States-owned companies. Table 1 contains company names and their value.

Table 1: 21 Largest Technology Companies in the World

Rank	Company	Valuation (\$B)	Type	Country
#1	Apple	\$915	Public	USA
#2	Amazon	\$828	Public	USA
#3	Alphabet	\$781	Public	USA
#4	Microsoft	\$771	Public	USA
#5	Facebook	\$556	Public	USA
#6	Alibaba	\$484	Public	China
#7	Tencent	\$477	Public	China
#8	Netflix	\$173	Public	USA
#9	Ant Financial	\$150	Private	China
#10	Salesforce	\$102	Public	USA
#11	Booking Holdings	\$100	Public	USA
#12	Paypal*	\$100	Public	USA
#13	Baidu	\$89	Public	China
#14	Uber	\$72	Private	USA
#15	JD.com	\$56	Public	China
#16	Didi Chuxing	\$56	Private	China
#17	Xiaomi	\$54	Private**	China
#18	eBay*	\$37	Public	USA
#19	Airbnb	\$31	Private	USA
#20	Meituan-Dianping	\$30	Private	China
#21	Toutiao	\$30	Private	China

Note: All 20 of the world's largest technology companies are located in the USA and China, <https://pazarlamasyon.com/dunyanin-en-buyuk-20-teknoloji-sirketinin-tamami-abd-ve-cinde-bulunuyor/> access date: 20.09.2019.

Although U.S. companies remain in the lead on the list, the technological momentum of Chinese companies is striking. China, which has a 3.8 trillion dollars' worth digital economy, transfers the largest share to investments in the field of 'artificial intelligence'. The owner of the world's most valuable artificial intelligence venture company is Alibaba, a company of Chinese origin. The Chinese government has published artificial intelligence textbooks aimed at high school students.

China, which has 5 times more patent applications than the United States in the field of artificial intelligence, is at the top of the world in academic paper output. Coming to the fore with the concepts of 'deep learning' and 'data' in terms of artificial intelligence, China has embarked on a new 'technology wars' fight with the United States. The comparison of technology and internet competition between the two countries is shown in Table 2.

Table 2: Comparison of Companies of United States and Chinese Origin

	United States	China
Search Engine	Google	Baidu
E-Commerce	Amazon, eBay	Taobao, JD.com, Tmall
Video	Netflix, Hulu, Youtube	Tencent Video, iQiyi, Youku
Music	Apple Music	KuWo Music, KuGou Music
Social Media Messaging	WhatsApp, Facebook, Twitter, Instagram, Snap	WeChat, QQ, Weibo
Carpooling	Uber, Lyft	Didi
Home sharing	Airbnb	Xiaozhu
Flirting	Tinder	Momo

Note: Technology-oriented trade war of the US-China, <https://digitalage.com.tr/abd-cinin-teknoloji-odakli-ticaret-savasi/> Date of Access: 21.09.2019.

China possesses many important systems to obtain the data it needs on artificial intelligence. Perhaps among those, the most important system is the Social Credit System. The system refers to monitoring the daily activities of all citizens. This system, which is announced to make it mandatory for all citizens to use as of 2020, will categorize the behavior of Chinese citizens as good or bad.

China, which is taking the pulse of global markets with applications like Alibaba and Wechat, will be able to monitor data on the world's eating and drinking habits, hobbies, daily activities and even urban planning.

4. UNITED STATES - CHINA: TECHNOLOGY WARS

The first contact point of the technology war between the United States and China was on the axis of "Huawei and spying". Donald Trump has accused Chinese students studying within the United States of spying. The number of Chinese students in the United States constitutes 30% of the total number of foreign students. Chinese students who returned to the country at the first step by the decision of the Chinese government, recently have begun to stay in the United States and working in technology companies, even rising to important levels. The fact that Chinese Apple employee Xiaolang Zhang was caught fleeing to China with a driverless vehicle project that Apple planned to produce and kept its information confidential, have made Chinese students controversial within the United States. The investigations on alleged violation of U.S. sanctions on Iran and data theft by the daughter of the owner of Chinese company Huawei and its Chief Financial Officer, have been aggravating the technology wars more and more. (Çin ve ABD'nin yapay zekâ savaşı, <https://www.aa.com.tr/tr/analiz-haber/cin-ve-abd-nin-yapay-zek%C3%A2-savasi/1389150>)

As Bloomberg writer Tim Culpan noted in his article "The technological cold war has begun," the technological war has begun between the United States and China. The Donald Trump administration has banned Huawei, the technology company that aims to become a global leader in 5G technology in telecommunications, from entering the United States' 5G market. Google has announced that it will not allow the latest models of Huawei phones to use Android applications, while microchip companies such as Qualcomm Inc, Broadcom Inc, have announced that they will stop selling their products to Huawei. (Huawei krizi ABD ile Çin'in diplomatik soğuk savaşı mı? <https://www.bbc.com/turkce/haberler-dunya-48398311>)

The United States argues that because of Huawei's proximity with the Chinese government and its dominance over the 5G market, Huawei will gather information about Western countries, organizations and citizens. The charges against Huawei are collected under 5 titles: (Huawei: Batılı ülkeler neden Çinli teknoloji devinden korkuyor? <https://www.bbc.com/turkce/haberler-dunya-47606805>).

Information Gathering- Huawei, which reached 200 million mobile phone sales on a global scale last year, is the 2nd largest smartphone manufacturer in the world. It is Huawei's relationship with the Chinese military that makes Huawei a threat to the Western world and the United States. Huawei's founder, Ren Zhengfei, is both a member of the Communist Party of China and an engineer who served in the Chinese army. The Western world, which claims that when Huawei is asked to share information obtained from other countries, it will not be possible for the company to remain indifferent to this demand, express their concerns about the right to privacy.

Another concern of the Western world is that the communications of Chinese companies Huawei and ZTE, which operate in the United States, can be monitored, thus bringing about the risk of cyber-attacks on critical infrastructure and facilities such as the power grid.

Backdoors- The backdoors, which are referred to as escape points of technological applications, allow access by cracking security protocols. The device manufacturers do not resort to this method and do not prefer it because it will be noticed by mobile phone operators. Huawei's founder Ren Zhengfei has stated that the Chinese state does not want 'inappropriate information' and that the only bond between the company and the state is the tax.

Five Eyes Alliance- The international organization, formed by intelligence agencies from the United States, the United Kingdom, Australia, Canada and New Zealand, is called the 'Five Eyes Alliance'. The Five Eyes alliance, formed to monitor the Soviet Union and the Eastern Bloc during the Cold War, turned to counterterrorism after the end of the Cold War, and recently has been paying attention to China and China's activities outside the country. As the United States strengthens the security of supply of 5G technology, the pressure by Germany and Britain indicates 'stay away from Huawei'.

Intelligence Laws- The Chinese Communist Party adopted a National Intelligence Law in 2017. The shallow expressions in the law raises questions about data privacy. The phrase in the Article 7 of the Law "companies and citizens to assist, support and cooperate in intelligence work" is troublesome for Western countries. The Donald Trump administration's imposition of sanctions on Huawei and the support of major American-based technology companies for this decision, aims to seriously hurt Huawei as a player in the global smartphone market. With this move, Huawei will have to limit its sales to only the Chinese market, even if it can produce phones without the parts it sells to American companies. (Koşar, 2019:52)

At this point, we look at what the figures say; according to the data announced in the first quarter of 2019, Huawei realized 17 million more sales than Apple with 60 million smartphone sales, increased market sales by 50% compared to the first 3 months of 2018, and increased its market share to 17%. During this period, Apple's phone sales fell by 20% to 42 million, and its market share declined from 14% to 12%. Among the most selling smartphone brands, Chinese manufacturers are at the forefront. It can be observed that the top 5 most-selling brands include Huawei, the world's second-largest smartphone maker, as well as Chinese brands Xiaomi and Oppo. (Ticaret savaşında 2. perde: Teknoloji savaşı, <https://www.ntv.com.tr/teknoloji/ticaret-savasinda-2-perde-teknoloji-savasi,LOORZbAaRECWlaqqLFOH4A>)

According to third-quarter phone sales data for 2019 compiled by one of the world's major statistical companies, Gartner, Apple suffered losses on its revenue chart compared with the previous year. Huawei, on the other hand, continues to achieve double-digit revenues and double-digit growth despite the declining smartphone market. Huawei, which has been unstoppable despite United States sanctions, is also among the most successful companies in terms of growth figures. We see Samsung coming at the first place on the list. Apple, whose sales fell by 1.3%, and whose market share fell from 11.8% to 10.5%, is trying to recover, Xiaomi is down by 0.2%, while Oppo is up by 0.1 %.(Telefon satışları düşüyor! Huawei'de yüzler gülüyor<https://shiftdelete.net/2019-akilli-telefon-satis-rakamlari-dusmeye-devam-ediyor>)

Despite the phone sales declining due to technology wars, it has been observed that Apple is melting down, while Huawei achieving the results it wants by moving in accordance with its plan. The first three quarters of 2019 shows that technology wars in the first place have failed to slow Huawei's pace. It also suggests that the Trump administration has lost billions of dollars and millions of employment opportunities in the field of technology as some American companies have had to move their knowledge on intellectual property and software to China in order to do business in China. This claim, which includes the loss of capital and employment, as well as accusations of technology theft, constitutes another theme of technology wars. In technology-intensive production, every step taken is patented and confined to monopolistic ownership. U.S. companies have millions of patents in consumer electronics, artificial intelligence, various software algorithms and digital technologies. Because of these patents, not every country and company that wants to take advantage of advanced technology has the right to freely use technological achievements. They have to be dependent on companies that own these patents and pay per product produced. This issue, which has been widely debated throughout the world, has become the subject of technology wars. In response to the Trump administration's claims, China is content to give a general response that emphasizes its own technological investments and power. (Koşar, 2019:54)

Amid intellectual property battles, the United State has blacklisted the Taobao Company under E-commerce giant Alibaba for the sale of counterfeit products. Donald Trump's statement; "We're talking about huge damage to intellectual property. You can't even guess the figures" reveals the numerical dimension of intellectual property. (ABD'den Çin'e fikri mülkiyet hırsızlığı suçlaması <https://www.dunya.com/ekonomi/abdden-cine-fikri-mulkiyet-hirsizligi-suclamasi-haberi-399083>)

In the period towards the end of 2019, the announcement that the two countries have agreed in principle to end the "trade wars" that began between the United States and China, causing massive price instability in world markets, has caused excitement across the globe. The prospect of a final outcome of the unstable talks, which have gone on without a clear consensus, has caused excitement all over the world. Donald Trump shared on his social media account, "We are very close to signing the great agreement with China. Both of us want the same thing." His statement has strengthened the possibility of a deal.

If the two countries agree, it is expected that the United States will reduce the customs tariffs it has imposed on China for the past 17 months by about 50%. It has been expressed that China, on the other hand, will buy 40 billion to 50 billion dollars' worth of American agricultural products. It is inevitable that the agreement process, accompanied by a loosening up in technology and intellectual property, will bring the technological cold war to a halt. (Ticaret savaşları bitiyor mu? ABD, Çin ile anlaşmaya çok yakın <https://tr.euronews.com/2019/12/12/ticaret-savaslari-bitiyor-mu-abd-cin-ile-anlasmaya-cok-yakin>)

5. CONCLUSION

The trade and technology wars between the United States and China must be seen as a result of changing power relations in the world economy. The fact that China has increased its economic dynamism with projects such as "Made in China in 2025" and "Belt and Road Initiative" has also attracted the attention of the Donald Trump administration. But, despite the trade wars, the United States' trade deficit with China has increased from \$ 347 billion in 2016 to \$ 375 billion in 2017 and \$ 420 billion in 2018.

The economic paradigm of the 21st century is technology. Technology intensive manufacturing, high added value, artificial intelligence, robotics and digitization are the milestones of this century. The Cold War of Technology stems from this hot spot between the United States and China. The close contact on the Huawei axis has been shaped by the technological breakthroughs of both countries. Huawei has installed more than 100,000 5G base stations worldwide. As a 5G network provider for more than 170 countries, the company has gained the support of many countries such as the UK, Germany and India. Many countries have not joined the Trump administration's 5G communication bans of Huawei. So much so that Huawei has surpassed Apple in world mobile phone sales, has been placed second after Samsung, and has become one of the world's largest monopolies in telecommunications infrastructure. (Koşar, 2019:52)

U.S. President Trump has blacklisted Chinese company Huawei's products for allegedly posing a security risk to his country. Trump, who first began his chain of sanctions by raising the tax imposed on 200 billion dollars' worth of products imported from China, from 10% to 25%, has banned American companies from using Huawei equipment. (Teknoloji Savaşları Cep'e Girdi, <https://www.cnnurk.com/teknoloji/ticaret-savasi-cepe-girdi?>). Trump's decision has drawn support from the giant companies of Silicon Valley. U.S. giant technology companies such as Intel, Broadcom, Qualcomm and Xilinx, as well as Google, have announced that they suspended their dealings with Huawei and would not supply products. (Ticaret savaşında 2. perde: Teknoloji savaşı, <https://www.ntv.com.tr/teknoloji/ticaret-savasinda-2-perde-teknoloji-savasi,L0ORZbAaRECWlaqqLfOH4A>)

Despite the Trump administration's threat of sanctions, China plans to play a leading role in about 10 technology-dominated strategic sectors in the fields of technology and manufacturing. The Beijing Administration aims to become self-sufficient 40% by 2020 and 70% by 2025 in the production of materials and key parts of aerospace, aerospace and information technologies. (Çin-ABD ticaret savaşını 'teknoloji ve nadir madenler' tetikliyor. <http://www.hurriyet.com.tr/dunya/cin-abd-ticaret-savasini-teknoloji-ve-nadir-madenler-tetikliyor-41295009>).

The technology wars have prompted Chinese companies to "develop their own operating systems and applications". With China's control of the internet space, the state control over users inside the country will intensify. The possibility of the formation of 'a technological Iron Curtain' stands out as the biggest question mark on China. In the period towards the end of 2019, the fact that trade wars are ending with a deal and we are entering a softening trend phase with the conclusion of the first phase agreement has caused a relaxation in the technology wars for now.

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