

The Technological War in the Field of Electronic Chips China and the United States as a Case Study

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Abstract:

The topic of “**The Technological War in the Field of Electronic Chips China and the United States as a Case Study**” is very important because this article will focus on the economic dimension of this chip war. We will begin with a symbolic image of a semiconductor chip, no larger than a grain of rice but worth billions of dollars, providing a detailed explanation of the global value of this industry. We will then examine how Washington attempts to protect the dominance of its giant companies in the technology market, in contrast to Beijing's efforts to achieve digital independence through massive investments in semiconductors.

The article will also consider the economic gains each power derives from this confrontation and its implications for the future of the global economy. Finally, we will attempt to answer the overarching question: **How does the cyberwarfare (chip warfare) between China and the United States affect geopolitical competition in international relations, and what is the significance of this war for Arab states?**

Keywords: The Technological War; Electronic Chips; China; the United States

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1. INTRODUCTION

Technological warfare is a complex and multifaceted phenomenon in international relations, due to its multiple dimensions and interconnected levels. One such example is the technological warfare in international relations between China and the United States. Managing such conflicts and their outcomes necessitates further research into them.

The phenomenon of technological warfare is one of the most complex and intertwined aspects of international relations, due to its multiple dimensions and overlapping levels. Among these conflicts is the technological war in international relations between China and the United States. Managing such conflicts and their outcomes necessitates further investigation. This technological war is based on the economic dimension of the chip war between the United States and China. It begins with a symbolic image of an electronic chip, no larger than a grain of rice but worth billions of dollars, then delves into a detailed explanation of the global value of this industry. It then illustrates how Washington attempts to protect the dominance of its giant companies in the technology market, in contrast to Beijing's efforts to achieve digital independence through massive investments in semiconductors. The analysis also considers the economic gains each power reaps from this confrontation and its impact on the future of the global economy. Based on this premise, the question : The main question can be posed as follows: How does the cyberwarfare (chip warfare) between China and the United States affect geopolitical competition in international relations, and what is the significance of this war for Arab states?

Several sub-questions fall under this main question, including:

- What is meant by technological warfare?
- What is the significance of the cyberwarfare in international relations?
- What are the reasons for the technological competition surrounding electronic chips between China and the United States?
 - What is the impact of this technological warfare (chip warfare) on Arab states?

This study is based on the following main hypothesis: Cyber warfare and chip warfare between China and the United States affect the international system by intensifying geopolitical competition. This is clearly evident in the political and economic significance of this war for Arab states.

This study employs several methodologies:

- **Historical Méthod:** Examining the historical development of technological warfare in international relations.
- **Case study Méthod:** Using the United States and China as a case study.
- **Descriptive-analytical Méthod:** Describing and analyzing the nature of technological warfare (chip warfare) and its impact on international relations and the international system, and understanding the nature of the international conflict between the United States and China.
- **Study limitations:**
 - **Spatial limitations:** The study focuses on China and the United States.
 - **Temporal limitations:** From the escalation of the technological trade war between China and the United States in 2016 to the present day (2026).
 - **Thematic limitations:** The importance of the topic of cyber warfare (chip warfare) between China and the United States and the geopolitical competition between them.
- **Defining the Study Concepts:**
 - **Technological Warfare:** This is a pattern of conflict between nations, including the United States and China, that relies on technological competition in various economic, political, military, and electronic fields.
 - **Electronic Warfare:** This is the use of electronic and digital means in information or communication systems, meaning the use of technology in warfare.
 - **Chip Warfare:** This is a strategic geopolitical competition for control over electronic chips or electronic components and the acquisition of advanced technologies. It emerged between China and the United States as a trade war between them.

It is important to note the complementary relationship between these three concepts.

To answer this question, three main axes were adopted:

First: Technological warfare in international relations (its concept, parties involved, and causes)

Second: Technological warfare in the field of electronic chips: China and the United States as a model

Third: The future of technological warfare in the field of electronic chips: China and the United States as a model

2. The technological trade war in international relations between China and the United States of America (its concept, parties, causes, and areas):

2.1 The concept of technological warfare in international relations :

Technological warfare is a complex and multifaceted phenomenon in international relations, due to its multiple dimensions and interconnected levels. One such war is the technological war in international relations between China and the United States. The world has never before witnessed such a rapid tectonic shift in the global balance of power resulting from China's rise. China's share of the global economy is increasing rapidly, projected to reach 30 percent by 2040, compared to the decline of the US economy to 16 percent today. This economic growth is transforming China into a formidable political and military competitor. The possibility of the United States and China finding themselves embroiled in a war seems unlikely, and would be unwise.¹

2.2 Aspects of technological warfare in international relations :

From this perspective, we conclude that there is a technological trade war between the United States and China. This refers to the ongoing economic conflict between the two largest economic powers in the world, China and the United States. Most commercial companies in both countries are targeted in this escalating conflict, which threatens the stability of the global economy and affects the growth rate of international trade, manufacturing rates, capital flows, and foreign direct investment. A trade war involves the imposition of tariffs between two or more countries to achieve economic benefits, protect domestic industries, increase exports, and consolidate economic dominance.²

2.3 Reasons of technological warfare in international relations:

The reason for the technological trade war in international relations between China and the United States is the "conflict of interests between the two parties, which led to escalation in order to protect their threatened interests and the actual use of pressure tactics by both sides, at varying levels."³

Since the 2016 US presidential election, President Donald Trump was not receptive to US trade relations with China due to the existing disparity between the two economies, which resulted in a trade deficit. President .Trump wanted to impose tariffs on China, reduce its imports, and prevent it from stealing American intellectual property, which cost the US economy dearly. In addition, Trump promised that the United States would renegotiate trade agreements, as it was a party to the North American Free Trade Agreement (NAFTA) and would withdraw from the Trans-Pacific Partnership (TPP). The United States initiated a trade war against China in 2018. There are several reasons why President Trump imposed massive tariffs on imports and unilaterally launched a trade war against China, including:⁴

First, he acknowledged that China had unfair trade relations with the United States and suffered from a large and persistent trade deficit of approximately \$375.23 billion. Therefore, he sought to reduce this trade deficit by restricting Chinese imports. Furthermore, the Trump administration requested a \$100 billion reduction in the bilateral trade deficit.⁵

Second: Trump complained about claims by Chinese individuals and companies of technology transfer through both legitimate and illegitimate means. He accused China of stealing American intellectual property by forcing technology-intensive American companies into joint ventures with Chinese firms to transfer technology, enabling American companies to operate and access promising Chinese markets. Estimates suggest that the theft of American intellectual property costs the US economy between \$225 billion and \$600 billion annually, in addition to costing many American jobs. Trump expressed hope that by imposing tariffs on Chinese imports,

particularly in research and development and technology-based products, China would reconsider its policies, cease manipulating its currency, and adopt new policies that provide a better business environment for US exports and investments in China. He also expressed hope that the tariffs would protect domestic industries from unfair foreign competition, while taking into account certain US national security concerns.⁶

3. Technological warfare in the field of electronic chips: China and the United States as a model

3.1 The concept of Technological warfare in the field of electronic chips:

The "**chip war**" is one of the most prominent technological conflicts on the international stage in recent years, with major powers, primarily the United States and China, vying for control of the semiconductor and chip market, which forms the cornerstone of modern technologies such as smartphones, electric vehicles, and artificial intelligence. This competition has led to a range of repercussions affecting international relations, economic policies, and the national security of the countries involved.⁷

3.2 The chip war and its repercussions on international relations:

These repercussions are as follows:⁸

-Technological and Economic Competition

Semiconductors are a strategic resource in the digital economy. The United States seeks to impose restrictions on technology exports to China, such as reducing the supply of advanced chips used in developing artificial intelligence and advanced computing devices to Chinese companies. On the other hand, China strives for self-sufficiency and reduces its dependence on foreign suppliers by developing its domestic chip industry.

-National Security and Strategic Alliances

Countries consider chips a part of their national security due to their uses in military applications and sensitive communications. This has led to international alliances to enhance technological capabilities in the face of China's growing influence. For example, the Quad alliance, comprising the United States, Japan, Australia, and India, aims to achieve strategic balance in the Indo-Pacific region.

-Impacts on Global Supply Chains

Global supply chains have been affected by increasing restrictions on semiconductors, as manufacturers rely on limited sources of these components. These tensions have led to delays in the production of many electronic devices and consumer products, prompting many countries to invest in building domestic semiconductor manufacturing plants to reduce their dependence on foreign suppliers.

-The Race for Technological Innovation

Competition in the semiconductor sector is accelerating the pace of technological innovation, as countries and companies strive to develop new technologies to gain a competitive edge. These efforts are also linked to advancements in fields such as artificial intelligence and quantum computing, which rely heavily on these advanced components.

-Implications for Developing Countries

The gap between developed and developing countries in advanced technology is widening. Many developing countries find themselves unable to keep pace with these developments due to a lack of technological and knowledge resources, further exacerbating the digital divide. Some of these countries also face pressure to adopt policies that align with the interests of major powers seeking to dominate this industry.

3.3 The Impact of Chips on US-China Relations:

Semiconductor chips significantly impact US-China relations, representing a central issue in their technological and economic rivalry. The importance of chips stems from their fundamental role in modern technology, making control over them a matter of economic, security, and political significance. The United States has imposed strict restrictions on the export of chips and advanced technologies to China, particularly chips used in artificial intelligence and military applications. These restrictions aim to limit China's ability to develop advanced technologies that could be used in economic or military competition. China responded by launching initiatives to reduce its reliance on American technology, such as the “Made in China 2025” initiative, which aims to achieve self-sufficiency in several industrial sectors, including semiconductor manufacturing.⁹

The United States and China seek to exert influence through control of technology, a key strategic factor in the global economy. Possessing chip production capabilities gives countries the power to influence global markets and businesses. This competition has led the United States to strengthen its alliances with other countries, such as Japan, South Korea, and Europe, to ensure that China's access to essential technologies is restricted. Semiconductors are a key component of advanced defense systems, making them a sensitive issue in security policy. Advanced chips enable the development of intelligent systems such as drones, military satellites, and artificial intelligence technologies used in defense.¹⁰

The United States fears that China will use these chips to develop military technologies that threaten its national security, exacerbating tensions between the two countries and fueling the technological race. Global supply chains are being affected by tensions between the US and China, as both sides try to secure independent sources of chips. The US is seeking to reduce its reliance on China and develop domestic chip manufacturing through large-scale investment programs. On the other hand, China is working to boost its domestic production and establish regional alliances to secure its chip needs, further fragmenting the global market and posing new challenges for companies.¹¹

4. The future of technological warfare in the field of electronic chips: China and the United States as a model:

4.1 Opportunities

The impact of semiconductors on US-China relations is likely to continue in the future, as they will remain an arena for technological competition. The US may continue its policy of technological isolation of China, while China will strive for greater technological independence, potentially leading to a division of the global economic system into two competing technological camps.¹²

-Opportunities for Arab Countries to Enter the Semiconductor Sector:

Arab countries can enter the semiconductor manufacturing and development sector, but this requires meeting several fundamental requirements and overcoming numerous challenges. Although this field is

complex and requires massive investments, there are inherent opportunities given the increasing global demand for semiconductors, especially with the focus on digital transformation adopted by many Arab countries.

The semiconductor industry is one of the most expensive and complex industries, requiring massive investments to establish advanced factories in clean environments equipped with cutting-edge technology. High costs include specialized equipment, research and development, and technological infrastructure, making entry into this sector extremely expensive.

-Lack of Expertise and Specialized Human Resources:

The semiconductor industry relies heavily on advanced skills in electronic engineering, materials science, and information technology. Arab countries need to build and develop specialized expertise in this field by developing advanced educational and training programs and strengthening partnerships with international universities and research centers.

-Dependence on Supply Chains:

The semiconductor industry requires reliance on complex supply chains that include the supply of raw materials and precision components such as silicon, as well as dependence on advanced technologies from other countries. This makes the industry vulnerable to any disruptions or trade restrictions, especially in light of international tensions between major powers such as the United States and China.

-Technical and Innovative Challenges:

Developing semiconductors requires advanced innovative and technological capabilities. Semiconductor technology is rapidly evolving, and this field requires continuous investment in research and development. Arab countries need to increase spending on scientific research and development, as well as create partnerships with global companies to transfer technology and build local expertise.

-Intense Global Competition:

Arab countries face significant competition from major players such as China, the United States, and Taiwan, which possess advanced technologies and giant companies like TSMC, Samsung, and Intel. It is difficult for Arab

countries to compete with these powers without building special competitive advantages, such as focusing on specific products or specific areas of the value chain.

4.2 Challenges

In his book **"The Return of Marco Polo's World: War, Strategy, and American Interests in the 21st Century,"** Robert Kaplan discusses the struggle for global dominance resulting from major global projects, such as the Belt and Road Initiative, which embodies China's geostrategic vision.¹³

Fears of a new economic crisis in 2020 dominated publishing throughout 2019, fueled by trade wars, escalating polarization between China and the United States, and the weakening of international economic institutions. This coincided with efforts to reform national economies. Numerous books addressed the political and economic influence of the world's wealthy. Anand Gerard Haradas, for example, argued that we are witnessing the emergence of a wealthy-dominated economy in his book **"Winners Take All: The Elite's Game of Changing the World."** He maintained that balanced politics, rather than relying on the wealthy, remains the best way to address major problems. Concerns about the potential collapse of the global trading system due to the conflict between the United States and China also garnered attention. Paul Blochstein, in his book **"The Rift: China, the United States, and the Disintegration of the Global Trading System,"** warned of a rift that could threaten the global economic order. He argued that the United States' desire to exclude China from the global trading system is a misguided approach, as China's exclusion undermines the system's viability and its ability to impose rules. Actors in the global economic system.¹⁴

Through an analytical reading of books discussing war between the United States and China, particularly the writings of thinker Graham Allison, titled **"The Inevitability of War Between a Rising Power and a Hegemonic Power,"** the question arises: Can China and America escape Thucydides' trap? The United States and China can avoid war between them, provided they recognize and accept two difficult truths:¹⁵

First, if things continue on their current trajectory, war between them

in the coming decades is not only possible, but the likelihood of it is far greater than we acknowledge today. According to historical records, the probability of war is always much higher than the probability of it not occurring. Underestimating this danger only increases its risk. If the leaders of China and the United States continue to act in the ways they have for the past decade, the two countries will inevitably end up at war.

Second, war is not inevitable. History teaches us that major powers can manage relations with their rivals, including those who pose a threat to their leadership position, without resorting to war. The record of successes, and even failures, in this area offers many lessons for contemporary world leaders. As George Santayana said, only those who fail to learn from history are doomed to repeat it. The current rivalry is between the United States and China. Everyone knows about China's rise and the growth of its economy, but few understand the extent of this growth and its consequences. This is underscored by the famous statement of the former Czech president: "It happened so fast that we haven't even had a chance to be surprised yet." A trade war between the United States and China is not inevitable. Much of the political establishment and public opinion are naively content with the possibility of war. On the other hand, fatalists see an insurmountable force rapidly approaching something seemingly immovable. Neither side truly grasps the situation. If the leaders of both sides studied past successes and failures, they would find a wealth of ideas and insights that could help them develop a strategy to achieve their respective national interests without resorting to war. Frequent and close presidential summits are essential, along with additional meetings of working groups from both sides. The administration Maintaining this relationship without war requires sustained attention and care from officials in both governments, week after week, and at the highest levels. It also requires a profound level of mutual understanding, something not seen since Henry Kissinger's talks that revitalized relations between the United States and China in the 1970s. Most importantly, the matter demands radical changes, exceeding anything achieved to date, in the attitudes, intentions, and actions of both leaders and the public.

In conclusion, the semiconductor industry appears to be no longer merely an economic option or a technological luxury, but rather an existential issue intertwined with national security policies and the shaping of the new world order. In a world undergoing a shift towards a "knowledge economy," where advanced technology forms the backbone of modern life and the engine of progress, it becomes imperative for Arab states to respond to this challenge. Their entry into this field means not only mastering the technology that underpins current and future innovations, but also achieving strategic independence that protects them from dependency and strengthens their position on the international stage.¹⁶

5.Conclusion:

In conclusion, the technological war in the field of semiconductors between China and the United States is a matter of consolidating hegemony and establishing superiority for one side. The question remains: will their fate be war, or is there a possibility of avoiding military confrontation? This is what Graham Allison addressed in his book, "Their Fate: War and the Possibility of Avoiding Military Confrontation." Could American power end by 2030? China's rise as an economic power after the United States, and its transition to global power, will inevitably lead to diverse and complex challenges, requiring it to adapt to the international and global system as a whole.

- recommendations:

- The topic of the technological war in the field of semiconductors between China and the United States must be highlighted.

- The study of the topic of "the technological war in the field of electronic chips between the United States and China" hinges on the existence of political will among a range of actors to discuss and enrich the debate on this pivotal and important subject in international relations.

The ambition remains for Arab states to transform this challenge into a springboard for a stronger and more independent future, becoming partners in global decision-making, not merely recipients of technology. This is an opportunity to rebalance the international equation and rebuild an Arab role that reflects the nation's aspirations and its capacity to confront major

challenges with a spirit of innovation and independence.

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