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Challenges Faced by the WTO Framework in Addressing Unilateral Economic Sanctions: The Case of US Sanctions Against Huawei

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Abstract: In the context of increasing economic sanctions among countries and the prevalence of trade protectionism, the choice of trade partners by governments has shifted away from aligning with free market competition principles. Instead, they now prioritize collaboration with allied nations within their respective blocs to ensure security and stability. This shift has undoubtedly posed significant challenges to all multilateral international economic organizations, particularly the WTO. Due to the mutual imposition of sanctions between nations, the existing legal frameworks and institutional structures are inadequate in effectively guiding countries to redirect economic competition away from resource consumption. On the contrary, they fail to constrain the unilateral actions of hegemonic states that infringe upon the sovereignty and human rights of sanctioned nations, thereby inflicting harm on the global economy. This article discusses the characteristics and evaluations of unilateral economic sanctions and analyzes the intellectual property aspects of the Huawei sanction case. By examining the legality of Articles 27, 28, and 40 of the TRIPS Agreement, the study assesses the actual impacts of these sanctions. Furthermore, it identifies existing deficiencies within the WTO concerning international intellectual property law and highlights the challenges posed by technological advancements, the maintenance of global supply chains, and the need to steer competition away from a Thucydides Trap towards a trajectory more conducive to global economic development.

Keywords: Unilateral economic sanctions, Trade-Related Aspects of Intellectual Property Rights (TRIPS), Intellectual property right.

1. Introduction

The use of economic measures aimed at restricting other countries based on foreign policy and political objectives has been a major tool of competition and balance between states since the end of the Cold War. The legal basis and legitimacy of such measures under international law have been the subject of much academic debate, with scholars also exploring their actual impact and the development of relevant international institutions. Employing a legal analysis of unilateral economic sanctions, this paper examines the legitimacy of US sanctions against Huawei. It further investigates the institutional challenges posed by the consequences of unilateral economic sanctions on the *Trade-Related Aspects of Intellectual Property Rights (TRIPS)* framework. It provides a reference direction

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for the reform of existing TRIPS provisions and institutional development, facilitating a balance between the protection of intellectual property rights and the sovereign rights of states to develop freely. Additionally, adjustments within the TRIPS framework will hold reference value for international legal frameworks in other areas under the WTO, helping to redirect the negative waste of resources resulting from inter-state competition toward a model and direction that promotes the prosperity of the global economy and the international community.

2. Unilateral Economic Sanctions

In the current international environment, the typical forms of unilateral economic sanctions include restrictions on trade imports and exports, limitations on financial investments, as well as other measures such as travel bans, military restrictions, and diplomatic constraints [1]. Its main characteristics are reflected in the fact that state actors, without reaching a consensus within the international community or engaging in discussions with international institutions, implement economic restrictions and sanctions against other countries in order to achieve political or economic objectives. Due to the lack of dialogue with other state actors and international organizations at the systemic level, such actions often impact existing international relations and the global order. Thus, the legitimacy and legality of these measures, as well as their effects on the international community, have long been a topic of academic research. Some scholars argue that states should exercise a certain degree of flexibility in asserting their sovereignty, allowing them to prioritize their sovereignty and national interests in times of utmost urgency. Moreover, some scholars contend that the formulation of international law is often influenced by hegemonic pressures, thus necessitating greater emphasis on the independence of state sovereignty [2]. However, scholars holding opposing views argue that unilateral economic sanctions violate the spirit of international law concerning protectionism and non-discrimination. They further contend that such sanctions lead states to neglect their human rights obligations, resulting in severe humanitarian consequences, and exacerbate the fragmentation of international law [3]. This paper argues that the anarchic nature of the international system prevents international law from constraining state actions as promptly and effectively as domestic law. While international law should protect states' discretionary power over their sovereignty, this does not imply that the interpretation of sovereignty and national security is beyond scrutiny or accountability. Sovereign states may enjoy flexible discretion, but their actions and responsibilities must withstand the judgment of the international community and history.

Regarding specific cases and legal issues, the academic discourse on unilateral economic sanctions within the framework of international economic law has focused extensively on certain legal issues under *the General Agreement on Tariffs and Trade (GATT), the General Agreement on Trade in Services (GATS), the United Nations Convention on Contracts for the International Sale of Goods (CISG), TRIPS*, and *the Agreement on Technical Barriers to Trade (TBT)*, among others. These discussions revolve around different interpretations, including the scope of state sovereignty and national security and whether they should be subject to international institutional scrutiny; disputes over the recognition of international intellectual property and the methods of technology transfer and licensing; debates on the globalization of multilateral trade mechanisms and the development of regional international legal frameworks; and the impact of various interpretations and policies on international markets and the global economy. Cases involving national security and intellectual property have particularly provided a rich background and exploratory framework for the development of international economic law. Key points of contention in most unilateral sanction cases include whether the security exception under the GATT framework has been violated, the legitimacy of infringement determinations under the TRIPS framework, and issues such as anti-dumping and anti-subsidy.

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The US sanctions against Huawei, which this paper intends to discuss, are similarly influenced by these points of contention. The rulings and precedents regarding these provisions directly affect the outcomes of similar cases adjudicated under the World Trade Organization (WTO) framework, as well as the interests of state actors and the structure of the international system behind them. Therefore, this paper uses the case of US sanctions against Huawei to explore the legality of US government actions in the field of international intellectual property law and within the TRIPS framework.

3. Huawei case

3.1. Statement of Facts

Huawei is a Chinese high-tech company primarily engaged in the research, development, production, and sale of telecommunications equipment and smartphones. Due to China's state-capitalist model, the Chinese government exerts significant influence over the technology and telecommunications sectors. As a result, Huawei's leadership in the 5G sector raised concerns within the US government about potential national security risks. Consequently, in May 2019, the US Department of Commerce placed Huawei on the Entity List, citing the need to prevent US technology from being used by foreign entities in ways that could harm US national security or foreign policy interests [4]. On May 15, 2020, the US government issued a statement further restricting Huawei's ability to use US technology and software to design and manufacture semiconductors abroad, aiming to cut off Huawei's efforts to circumvent US export controls. This move was intended to prevent Huawei from accessing critical technology that could undermine US export regulations [5]. At the same time, then US Secretary of State Mike Pompeo announced the Clean Network initiative, which emphasized the exclusion of Huawei, ZTE Corporation, and other untrusted Information Technology (IT) suppliers from any transmission, control, computing, or storage equipment. The goal was to prevent untrusted and high-risk suppliers from compromising, manipulating, or denying services to private citizens, financial institutions, or critical infrastructure [6]. On August 17, 2020, the US Bureau of Industry and Security (BIS) added an additional 38 Huawei affiliates to the Entity List, imposing license requirements for all items subject to the Export Administration Regulations (EAR). Additionally, BIS modified four existing entries in the Huawei Entity List. The BIS further enforced license requirements for any transaction involving items under the jurisdiction of the Department of Commerce's export controls, as long as the transaction involved a party listed on the Entity List, such as Huawei (or other listed entities), whether acting as a purchaser, intermediary, or end user. These measures were aimed at preventing Huawei from attempting to circumvent US export controls to acquire electronic components developed or produced using US technology [7].

In response to the above-mentioned sanctions imposed by the US government, the Chinese government filed a lawsuit with the WTO, arguing that the US sanction policies violated Article I:1, Article X:1, Article X:3, and Article XI:1 of the 1994 GATT; Article 2 of the TRIMs; Article 28 of the TRIPS; and Article VI of the GATS [8], which signaled China's opposition to the US sanctions on the international law front.

3.2. Violation of TRIPS Provisions and Abuse of the Security Exception Clause

The fundamental reason behind the US government's imposition of economic sanctions on Huawei stems from discrimination. If Huawei were a company from a Western country, it likely would not have faced such harsh measures, including the disruption of its supply chain and the denial of market access. Instead, there might have been deeper technological and trade cooperation between the nations and enterprises, fostering mutual trust. This discriminatory treatment directly violates the spirit of Article 27.1 of the TRIPS Agreement, which states that patent rights shall be enjoyed and exercised without discrimination as to the field of technology, whether products are imported or locally

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produced [9]. The purpose of this provision is to establish a fair and non-discriminatory international patent protection mechanism, promoting technological innovation and transfer while ensuring fair market access and treatment for companies in the global market. Such discriminatory policies exacerbate barriers to trade protectionism and technological protectionism, further intensifying friction and competition between the two countries [10]. The resulting strain not only halts global intellectual property and technology exchanges but also severely impacts global supply chains, ultimately slowing down or even halting global economic growth. Additionally, the underlying Thucydides Trap in the technology and trade sectors is the core discriminatory issue in violation of this provision, as Huawei, from a rising power—China, has challenged the technological leadership of the United States.

In the lawsuit filed by the Chinese government at the WTO, one of the core issues regarding the TRIPS Agreement centers on whether the US's unilateral economic sanctions obstructed Huawei's normal exercise of its patent rights and whether they undermined the exclusivity and profitability of those patents, particularly under Article 28 of TRIPS. Article 28 primarily ensures the patent holder's exclusive rights over the patented product and the production process, including the right to use, process, and sell the patented invention [11]. The US government's actions, by restricting Huawei's patent rights, such as prohibiting Taiwan Semiconductor Manufacturing Company (TSMC) from using its 5-nanometer process technology to manufacture Kirin 9000 chips, severely impeded Huawei's ability to exercise its manufacturing, usage, and sales rights for related patents on the Kirin 9000 chip [12]. This article argues that the exclusivity of patent rights, as outlined in Article 28, not only emphasizes the exclusive use of technology and products but also highlights the patent holder's control and ability to use the intellectual property itself. The US unilateral sanctions have effectively nullified Huawei's ability to implement its patents in the production and sales stages, thereby stripping Huawei of its control and discretion over its intellectual property. Setting aside the legitimacy of national security as a basis for these sanctions, the act of using patents as a weapon constitutes a violation of patent rights in itself. The resulting impact—cutting off chip supplies—has significantly harmed Huawei's revenue and market share in the 5G smartphone sector, putting the company at a disadvantage in competition with other firms.

Although the Huawei case has yet to be resolved due to the suspension of the WTO dispute settlement mechanism, a similar case about Protection of Intellectual Property Rights—DS567: Saudi Arabia — has already been adjudicated. In that case, Saudi Arabia refused to impose criminal penalties on beoutQ Sports Channel (beoutQ), citing the security exception, despite clear intellectual property infringement. The WTO panel emphasized that the application of the security exception must meet certain conditions and cannot be abused. For instance, the exception requires the existence of a clear "emergency in international relations" or actual security threat. The panel ruled that the situation in Saudi Arabia did not meet these conditions and ordered Saudi Arabia to impose criminal penalties on beoutQ for intellectual property infringement [13]. The similarities between the two cases lie in the established fact of intellectual property infringement under TRIPS, and both defendants invoked the security exception clause as a defense. Therefore, the Saudi-Qatar case could provide valuable guidance for the US sanctions on Huawei. The US's protectionist actions did not occur during an "emergency in international relations" or under a legitimate security threat, meaning its economic sanctions and interference with Huawei's patent rights cannot be justified under the security exception clause. If the concern is that Huawei's provision of 5G technology and infrastructure might affect US communication systems, this issue could be resolved through bilateral agreements or by establishing secure confidentiality levels, rather than by unilaterally terminating cooperation in the production of 5G chips. Therefore, the US should bear international legal responsibility for violating Article 28 of TRIPS and for its arbitrary interference with Huawei's control over its patent rights.

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Moreover, the US's unilateral sanctions have caused direct commercial damage to Huawei's patent rights. Article 28 of TRIPS grants patent holders the right to improve their technology in the production and sales process, thereby maintaining a competitive edge in their industry. However, the US's sanctions effectively nullified Huawei's patent on the Kirin 9000 chip, undermining its core functionality. As a result, Huawei can no longer improve its patents through production, sales, and customer feedback, thereby losing its leading position in the 5G smartphone chip market. This has fundamentally weakened Huawei's market share and commercial activities. The US's unilateral sanctions, which infringe on Huawei's rights to use, process, further develop, or transfer its patents, also represent a form of unfair competition that disrupts the international market order.

In summary, the US's unilateral economic sanctions against Huawei cannot solely be defended on the grounds of national security; they must be examined within the broader framework of the global trade order. Using sanctions to weaken competitors and hinder their technological applications and market activities violates TRIPS provisions on patent exclusivity and disrupts fair competition in international markets. The WTO dispute settlement mechanism should further scrutinize these actions and make a clear ruling on their legality to prevent the abuse of the security exception clause from becoming a normalized tool in international trade.

3.3. Disrupting Market Order: Examining Anti-Competitive Conduct Under TRIPS Article 40

Huawei's leadership in telecommunications technology has also impacted US companies by squeezing their international market share, directly reducing their profitability. As a result, the US economic sanctions against Huawei, ostensibly aimed at safeguarding national security, also indirectly protect the market share and revenues of US telecommunications technology firms. This aspect deserves attention, as the sanctions, including cutting off Huawei's chip supply and prohibiting US companies from collaborating with Huawei, have severely impacted Huawei's production capacity and its ability to innovate and operate in the global market. Consequently, Huawei has lost much of its international market presence.

This situation aligns closely with the scenario described in TRIPS Article 40, which addresses the adverse effects on trade caused by restrictions on the use of intellectual property rights. The US sanctions against Huawei can be seen as a form of anti-competitive conduct, limiting Huawei's ability to leverage its intellectual property and technology, which, in turn, distorts fair competition in global markets. By restricting Huawei's access to key technologies and markets, the US sanctions have not only protected the market position of its own companies but also created unfavorable conditions for international trade, as outlined in Article 40 of the TRIPS Agreement [9].

Firstly, the economic sanctions severed Huawei's global 5G smartphone supply chain, directly restricting the global sales of Huawei's 5G phones and diminishing its competitiveness in the international market. Secondly, by prohibiting Huawei's 5G base station technology from entering the US market, the sanctions significantly weakened Huawei's ability to compete freely in both US and international markets, while also damaging the global 5G technology supply chain. As a result, the sanctions affected not only Huawei but also the global rollout and adoption of 5G technology. Due to these sanctions, a significant number of 5G orders were diverted to competitors such as Nokia and Ericsson, which gained market share as a direct consequence of Huawei's restricted participation in the global 5G race [14]. At the same time, to support Huawei's competitors, the US government enacted the Secure and Trusted Communications Networks Act, which provided funding to small and medium-sized telecommunications operators to help them replace Huawei equipment with that of Nokia and Ericsson. This move further solidified the competitive advantage of Huawei's rivals by directly facilitating the removal of Huawei technology from US networks and financially supporting

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the adoption of alternative equipment, effectively amplifying the impact of the sanctions on Huawei's market presence [15].

Whether it be the companies that benefited after the sanctions on Huawei or the US government's domestic subsidy measures for these firms, such actions point to the real intention behind the US sanctions—an abuse of market dominance, violating the spirit of TRIPS through technological protectionism and anti-competitive practices. Particularly, as these sanctions were imposed alongside the Trump administration's trade war against China, they further pushed US policy towards unilateralism and trade barriers, weakening the multilateral system of the WTO and the foundations of international law. These policy directions closely aligned with Trump's protectionist and anti-China rhetoric during his campaign, as well as with the administration's broader unilateralist approach on the global stage, as seen in its withdrawal from *the Trans-Pacific Partnership (TPP)* [16] , *the Paris Climate Agreement* [17], and repeated public criticism of the WTO [18]. These sanctions are thus part of a broader pattern of undermining multilateral institutions and pursuing protectionist policies.

Some scholars have pointed out that the US trade war against China and sanctions against companies like Huawei will trigger retaliatory measures from China, ultimately benefiting competitor firms and entities from other countries [19]. This paper argues that such a view is shortsighted. Unilateral sanctions and countermeasures that bypass WTO review and support only deepen trade barriers between nations. Particularly in the case of major global actors like China and the US, such divisions are magnified across East-West alignments, leading to broader geopolitical rifts. This widening gap fosters a trend of de-globalization within the international community, posing significant negative consequences for global trade and economic prosperity. As a result, international economic organizations like the WTO face immense challenges in promoting multilateralism, global economic freedom, and resisting protectionist and anti-competitive practices.

4. The Challenges of WTO

In the face of the US government's violations of TRIPS Articles 27.1, 28, and 40, the WTO's limitations become evident in areas, such as the review of security exception abuses, the harmonization of patent scope and infringement determinations, the identification and prevention of anti-competitive practices, and the challenge of resisting unilateralism. However, the broader international intellectual property and global trade issues reflected in this case go far beyond these specific concerns.

This case highlights deeper challenges within the global intellectual property regime, including the growing conflict between state sovereignty and international IP standards, the politicization of IP rights in the context of economic sanctions, and the uneven playing field created by dominant global powers. It also raises critical questions about how intellectual property rights can be protected in a way that promotes both innovation and fair competition in a rapidly evolving global economy. Furthermore, this case exposes the fragility of multilateral trade frameworks when confronted with powerful nations' unilateral actions, which undermine the fairness and balance intended by agreements like TRIPS. As globalization and technological competition intensify, the international community must address these systemic issues to ensure that intellectual property rights are respected and that global trade remains open and competitive.

4.1. The Challenge of Promoting Global Technological Progress

Using the US sanctions against Huawei as an example, this type of unilateral protectionist action cut off Huawei's access to semiconductor chip production technology, halting its ability to manufacture 5G smartphones. Additionally, by restricting Huawei's market access, the global deployment of 5G

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technology has been delayed, affecting other technological fields that rely on 5G as a foundational technology, such as the Internet of Things (IoT), autonomous vehicle technology, and artificial intelligence. A similar example can be found in the sanctions imposed by the US on certain Russian private companies, such as Mikron Group, T-Platforms, and Yandex, after 2014 [20]. These sanctions similarly disrupted the global supply chain for semiconductors and high-performance computing, delaying both Russia's and the global community's technological exchange, cooperation, and innovation in these fields. Such targeted restrictions on the use of patents foster technological discrimination, not only obstructing high-tech companies from legally accessing intellectual property but also limiting their ability to use specific patented technologies to develop and create new patents. This weakens the authority and effectiveness of TRIPS Article 27 from two dimensions. Over time, such technological monopolies will widen the gap between developed and developing countries in the international community. Technological barriers will force companies to expend more of their limited resources on re-exploring already developed patents, thereby draining global technological development of vitality and flexibility due to the waste of resources and time [21].

Moreover, since various countries and companies possess technological equipment with different parameters, it becomes difficult to standardize global technology. This results in inconveniences in technology exchange and daily life, while also significantly reducing the efficiency of international organizations when conducting reviews and arbitration, creating new vulnerabilities and risks in global governance. Advanced technologies being monopolized by a few countries and companies weakens global innovation. Many emerging companies, unable to enter patent pools, face restrictions on technology and patent licensing, hindering their capacity for technological innovation. As a result, industries may shift toward another form of monopoly and conservatism. Therefore, the implementation of Article 27 not only faces challenges in terms of legal scrutiny and arbitration but also requires discretionary adjustments tailored to different regions, levels of development, and technological sectors to better support technological exchange, cooperation, and progress [22].

At the same time, such unilateral economic sanctions hinder individuals or companies from controlling and transferring their patent rights. If more countries were to follow this approach, the global intellectual property protection mechanism would face a significant crisis of non-recognition and non-compliance. In extreme cases, some countries may invoke TRIPS Article 31’s compulsory licensing provisions to address the impact of technology sanctions on various industries [23]. This would, in turn, trigger more intense trade friction and retaliatory measures, adding greater uncertainty to the international trade market and further exacerbating the disruption to the global intellectual property protection system, creating new obstacles to consistent global patent protection.

In such an environment, companies would adopt a more cautious approach toward research and development investments, reducing funding in related areas, which would stifle global technological innovation and development. Finally, when this unilateral protectionist mindset becomes widespread and abused in the international market, anti-competitive behaviors and trade barriers would deepen, technology exchange and transfer in the global market would become more rigid, and the boundaries between state intervention and protectionism would blur. This would break the previously existing global free competition market structure, further deteriorating the environment for patent development and innovation.

Overall, TRIPS faces significant challenges in promoting global intellectual property protection and technological progress. Unilateral protectionist economic sanctions have led to technological monopolies, severely hindering the sanctioned countries' ability to exchange and access technology, and also restricting companies' rights to use their own patents. Additionally, the disruption of global supply chains caused by sanctions has impeded the development of key technologies dependent on these supply chains, slowing the pace of innovation in core technological sectors. At the same time, the risk of retaliatory measures, such as the abuse of compulsory licensing, and the spread of patent

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misuse further undermine the effectiveness and authority of TRIPS as a global intellectual property protection system.

These challenges not only limit international technological cooperation but also deal an unprecedented blow to the global innovation ecosystem. Balancing intellectual property protection with the promotion of fair technological exchange and innovation within the TRIPS framework will become a challenge that the entire international community must confront.

4.2. The Challenge of Maintaining the Integrity of Global Supply Chains.

A significant factor in the US sanctions against Huawei was its exploitation of the global industrial chain's interdependence. By prohibiting TSMC from using its patents to produce 5G chips for Huawei, it caused a supply cutoff, effectively weaponizing intellectual property as a tool in protectionist geopolitical conflicts. The disruption to the global supply chain is evident, as even after the sanctions, in 2023, Huawei's 5G Radio Access Network (RAN) equipment still held about 24.8% of the global market share, surpassing Nokia and Ericsson, maintaining its leading position [24]. Therefore, sanctions against Huawei directly impact the dissemination and supply of 5G technology.

Similar examples can be found in sanctions imposed by the US on Russia and Iran, where disruptions to patent supply chains and existing partnerships were also used as punitive measures. Such sanctions disrupt global supply chains, reducing the stability of international markets, accelerating the decoupling of technology sectors, and forcing multinational companies to rely on their own technological ecosystems. This regionalizes or politicizes patent protection, leading to an increasingly fragmented environment for technology and product supply chains.

In this scenario, agreements between companies give way to unilateral protectionist political intentions, often justified by national security or other reasons, which severely disrupt market order. Intellectual property protection becomes difficult to promote on a global scale, as differences between regions and political blocs create varied standards and barriers, hindering global scientific exploration and technological advancement. As intellectual property becomes more regionalized and bloc-based, bilateral or regional agreements will increasingly dominate, further weakening the influence and role of multilateral mechanisms like the WTO. This will prevent multinational companies from accessing the lowest-cost products and technologies globally, and people worldwide will be deprived of the technological and economic benefits brought by global free market competition.

There are numerous examples similar to the US government's approach of weaponizing intellectual property under the guise of the "national security exception." For instance, India has invoked the "compulsory licensing clause" in disputes with multinational pharmaceutical companies, leading to technological decoupling [25]. Similarly, the US government has cited technological sovereignty and restrictions on cross-border data flows to impose sanctions on TikTok and WeChat, disrupting global standards and data flow [26]. These cases contribute to the fragmentation and restructuring of global technology supply chains, and with an increasing number of such cases, this trend is becoming normalized.

The current TRIPS provisions are still designed with a focus on intellectual property protection, without taking into account the interaction between global supply chains and patents. Additionally, there are no mechanisms in place to safeguard the integrity of global supply chains. As a result, the existing framework faces immense challenges in maintaining the global intellectual property order and the free competition of market systems.

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4.3. The Balance between Unilateral Protectionist Measures Triggered by the Thucydides Trap and Intellectual Property Protection.

In the competition and friction between rising and established powers in the economic realm, unilateral protectionism is one of the most common methods beyond legitimate competition. Its most prominent feature is invoking the national security exception clause or similar pretexts to exert comprehensive pressure—financial, trade, technological, and personnel—on specific countries, companies, or strategic weaknesses. The impact on the global economy includes damaging global supply chains, industrial chains, and technological progress [27]. The Huawei case is a clear example of unilateral protectionist sanctions targeting a leading Chinese 5G technology company, which is a part reflection of Thucydides trap between the Sino-American relation. Similar examples include energy sanctions [28] and targeted financial sanctions against Russia [29].

At the core of these sanctions is the battle for technological dominance and market control. Established powers often emphasize strengthening intellectual property protections or use unilateral protectionist actions to maintain leadership in high-tech fields and reinforce their global market share. In contrast, rising powers tend to advocate for the legitimacy of forced technology transfer and the reduction of trade barriers to promote global technological exchange, cooperation, and the prosperity of the world economy.

TRIPS is currently challenged with regulating competitive behavior within its framework to foster global trade and sustainable economic growth while minimizing the negative impacts of this competition on the global economy. This involves tightening restrictions on the economic actions of sanctioning countries within the international community, as well as reviewing and providing remedies for the retaliatory actions of sanctioned countries. Clearly, the existing provisions and institutional frameworks are limited in their ability to address and regulate unilateral protectionist sanctions and counter-sanctions.

This is evident in the vague definition of "national security" under the security exception clause, the unclear boundaries of intellectual property protection for companies, the lack of institutional mechanisms to address global technological supply chains and development models, and the absence of strong anti-monopoly and anti-competitive frameworks. These institutional gaps make TRIPS incapable of curbing the weaponization of intellectual property and technological decoupling between nations. Consequently, economic competition between states continues in ways that are harmful to the global economy, obstructing scientific and technological exchanges and economic interactions between nations.

5. Conclusion

The unilateral economic sanctions imposed by the US on Huawei represent not only a restriction on Huawei but also a challenge to the global technology supply chain and market order. By leveraging its patent rights to defend its technological sovereignty, the US sanctions have violated multiple provisions of the TRIPS Agreement. In addition to undermining Huawei's competitiveness in the global market, these actions have disrupted the integrity of the 5G technology supply chain and slowed global technological innovation. Such sanctions reflect the increasingly fierce competition between state actors in the economic and technological fields within the international community.

In the field of international law, the abuse of the security exception clause in unilateral sanctions has further exacerbated the challenges faced by international organizations such as the WTO. The misuse of TRIPS provisions not only obstructs the protection of patent rights and technological progress but also undermines the integrity of global supply chains. At the same time, the spread of unilateralism has created more trade barriers, driving the trend of de-globalization and weakening the foundation of free market competition in the international community. In this case, these deficiencies

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are primarily exposed in the dimensions of the abuse of the security exception related to patent provisions, the disruption of global supply chains, and unfair competition. Therefore, balancing intellectual property protection, technological advancement, and competition among nations within a global multilateral framework has become an urgent issue that the international community must address.

Clearly, the existing TRIPS framework fails to adequately balance the need for developed countries to protect the outcomes of technological development with the growing demands for scientific progress in developing countries. Reforms to the current TRIPS framework should take these dimensions into account, ensuring that the needs of both developed and developing countries are balanced, thereby promoting the sustainable development of the global economy. The WTO and related international organizations must further refine their frameworks and strengthen restrictions on unilateralism and trade protectionism. Ensuring that technology exchange and cooperation in the global market are conducted on a fair and equitable basis is essential to addressing the increasingly complex international trade environment and technological competition of the future.

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