

US-China Technology Decoupling, The Division of The World, and A Symbiotic Future Economy

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ABSTRACT

From the perspective of US-China technology hegemony competition, this study presents the theory of Symbiosis, critiquing the deepening and spreading of decoupling between the US and China in the high-tech sector could divide the world in the long term. The issue of technology hegemony competition between the US and China centers on the technologies of the Fourth Industrial Revolution, which will determine the future economy. It can affect not only the economic and technological areas but also military and national security generating competition over ideology and values. By discussing US-China technology decoupling cases, U.S. sanctions on Huawei, standard competition and global supply chain rivalry, this paper will navigate the characteristics of U.S.-China decoupling and the possibility of dividing the world. Finally, this paper will shed light on the symbiotic implications for the future economy.

Keywords: Decoupling, symbiosis, future economy, technological supremacy

I. Introduction

In recent years, the world has been facing a 'global polycrisis', driven by the causal entanglement of crises across multiple global systems (Lawrence et al., 2024). Tensions and conflicts continue due to climate crisis, energy and food problems, financial instability, global supply chain (GSC) disturbance, and the Russia-Ukraine war, leading to increasing uncertainty about the future. The global complex crisis requires a joint response that integrates the transnational capabilities of the international community. In this complex crisis situation, the conflict and competition between the two G2 countries, the United States and China, have not shown any signs of abating and are spreading in all directions. On the surface, both the US and China acknowledge the need for cooperation to respond to the global complex crisis (Council on Foreign Relations, 2024). However, behind the scenes, each pursue their own interests and apply economic pressure on one another.

There is no global leadership to respond to the global complex crisis, and nationalism, protectionism, and unilateralism have become prevalent. As the liberal international economic order falters, globalization and free trade have reached a critical point, and 'slowbalization' or even de-globalization is emerging as a new global trend (Ashbee, 2024). Decoupling deliberately separates the global economic and technological ecosystem and shows one aspect of excessive competition and conflict between the US and China. If decoupling spreads on a global scale, it will be difficult to rule out the possibility of a 'fragmented world' or a 'bifurcated world' in which the world is divided into two (Petricevic and Teece, 2019). These issues raise the critical question of whether it is impossible to achieve an international order of coexistence in which we can all live together. This study will analyze the possibility of further bifurcation of the world order due to the deepening and proliferation of technology decoupling between the U.S. and China by focusing on 'technology hegemony competition'.

Technology hegemony competition is important because most of the contested issues involve technologies of the Fourth Industrial Revolution that will determine the future economy, which can influence military, security, and even ideological and value domains. Based on this analysis, we intend to find alternatives in the form of a 'symbiotic' future economy that can re-globalize economic flows disrupted by tax evasion, decoupling, and bifurcation (Park, 1939). Here, the approach based on the religious thought principle of 'symbiotic' may be criticized as excessively idealistic that it is excessive idealism. Nevertheless, the search for a 'symbiotic' alternative remains meaningful as it considers what constitutes just and reasonable measures while facing and gaining insight into the problems of the real world.

2. Theoretical Review

2.1. Symbiosis with the Future Economy

The greater the uncertainty about the future, the greater the need for prediction and preparation. In short, the future economy can be influenced by the innovative technology that drives the Fourth Industrial Revolution (Whaples, 2016). The fierce competition for supremacy over high-tech that will determine the future of humankind and the world, and the resulting division of the world, may represent a 'paradox of technological development'. Ultimately, technological development must contribute to human life and the future of the world, but it also may threaten it. In this respect, 'symbiosis' as an idealistic alternative for the future economy offers significant normative implications (Oughton et al., 2022). The unification principle or idea of unification of the Family Union, which aims for the one ideal world, sends a meaningful message in the era of severe U.S.-China strategic competition. The Family Union advocated symbiosis and justice as an ideological standard that leads to a just world community based on true love, not a world marked by conflict and division.

Symbiosis, public service, and public interest—central to the Family Union’s idea of unification—are ideal economic theories in terms of ownership (Raub and Weesie, 1993). It focuses on joint ownership and appropriate ownership as an idealistic principle that guides and regulates the economy. Symbiosis, explained by the principle of joint ownership and proper ownership, suggests the future ideal that my neighbors and I should live in ways that reject limitless accumulation or monopoly of possession and resources are evenly allocated (Margulis, 1971). Although this implied symbiosis does not directly address ownership in the context of international relations, there are many implications for predatory state relations: that is, a world of one-sided accumulation, monopoly, and exclusion. Therefore, the symbiosis of the 'family union' implies that if an interdependent world fragments due to one-sided or excessive control by a single country or party, it may be that humanity and the world will go down the path of strife together.

2.2. Decoupling and the Dividing of the World

After the turn of the century, the U.S. regarded China's economic and military rise and its technonationalist offensive against the U.S. as serious challenges to U.S. hegemony. It then chose the "decoupling" strategy as one of the measures to check China (Meidan, 2019). The U.S. first implemented decoupling through the imposition of high-rate additional tariffs on Chinese imports, the withdrawal of U.S. companies from China, and by placing a ban on U.S. companies' transactions and exports with Chinese telecommunications companies such as Huawei and semiconductor companies such as Fujian Jinhua (Harrell et al., 2019). Among these U.S. strategies, the high-tech sector is significant. Accordingly, decoupling between the U.S. and China has been widely pursued across the entire high-tech sector. As the US decoupling with China spread and intensified in various fields such as in the economy, military, and technology, interdependence became a geopolitical weapon and 'economic security' emerged as a new national concern. The interdependence that spread in the era of globalization has begun to threaten sovereignty and security. As interdependence, which symbolized globalization, has been weaponized, it is becoming a paradox leading to tax evasion. In the era of polarization between the East and West camps, centered on the US and Russia, there were few economic exchanges and competition and conflict were mainly focused on the military field. Therefore, the two nations were decoupled from each other. However, due to globalization after the post-Cold War, interdependence between countries has extended beyond traditional blocs and systems. In the fields of economy and trade, there is also a pattern of geoeconomic blockification to protect the free trade order (Santino 2024). Therefore, it is difficult to deny the possibility that the diplomatic, security, and military fields will expand and develop into the Cold War era's polarization, but the possibility of polarization in the economic and trade fields is unlikely to be high. In this respect, polarization reflects different concepts. The US policy to contain China and

her counter-action are the main drivers of mutual hostility between the US and China, leading not only to decoupling but also a 'differentiated world' in which the future economy is divided into two camps. Some point out that micro-level 'value chain decoupling' and macro-level 'differentiated governance' are being carried out in parallel.

3. US-China Technology Decoupling: Some Cases

China has been promoting the development of high-tech technologies as part of its 'technology development' strategy as a policy goal to achieve its Chinese dream (Godement et al., 2018). The U.S.-China technology hegemony competition stems from the U.S. recognition of the threat posed by China's 'technology development'. The gap between the U.S. and China has also narrowed significantly in the area of quantum computing, which could dramatically improve information processing speed by applying quantum physics principles. China is also strong in the AI field, with access to the world's largest market. As such, China's threat to the U.S. in the technology field of the Fourth Industrial Revolution has become an immediate rather than a future concern. Under this recognition, the U.S. has pushed for sanctions against Huawei, a Chinese telecommunications company with high innovation capabilities, to check and slow global expansion of Chinese-style technology standards and for technical isolation through global supply chain reorganization.

3.1. U.S. Sanctions on Huawei

China's Huawei is a leader in the global 5G market. In February 2018, intelligence agencies such as the CIA, FBI, and NSA warned against the use of Huawei products, and in August, the US government excluded Huawei from government procurement through the National Defense Authorization Act (NDAA). In May 2019, the Trump administration issued an executive order and placed Huawei on the export-restricted entity list, demanding that private companies stop trading. The United States raised cybersecurity issues as the official justification for sanctions against Huawei. It raised concerns that it was spying on information by using "backdoors" installed in Huawei's network systems and infrastructure, and that it could compromise national security by disrupting information and communication systems through "kill switches" (Castro, 2024). The United States also publicly pointed out that China has grown by stealing technology secrets or forcing technology transfer. In early 2019, it evolved into bloc-based diplomacy that united major allies to sanction Huawei.

However, the essence of the Huawei crisis lies in the technology hegemony competition surrounding 5G and the Fourth Industrial Revolution (Ryan and Burman, 2024). In fact, Huawei has the world's best price competitiveness and technology in 5G and networks. Huawei has won contracts to convert to 5G in developing countries such as Africa, Latin America, and Southeast

Asia. Huawei's network components were not only cheaper than their competitors, but they were also highly competitive due to their pre-established 4G network infrastructure in the region. In 2018, Huawei ranked first in the world with a 28% global mobile communication equipment market share (Mascitelli and Chung, 2019). Accordingly, the US sanctions on Huawei were designed to block China's expansion of its global 5G market share. In the wake of the Huawei incident, the US sanctions against China expanded beyond 5G and semiconductor-related trade to include general-purpose technologies like AI and supercomputers, and from May 2020, sanctions were placed on universities and research institutes related to high-tech in China. These US sanctions against China reflect the U.S. intent to block and exclude China from the global technology ecosystem (Hamdani and Belfencha, 2024).

3.2. Standard Competition

Standard essential patents are the foundation for gaining a technological edge in the global market through the spread of standard technologies and by generating revenue through patent licensing. China has been expanding its influence to allow its technologies to be adopted as international standards in high-tech fields. In 2018, a report by the White House National Security Council assessed China to be superior to the U.S. in 5G technology, and the U.S. Strategic Approach to China, released by the Trump administration in May 2020 (Lohman, 2019), pointed out that the U.S. should lead the setting of standards in high-tech fields such as 5G and AI in the future, and that it should actively cooperate with allies and partner countries to prevent the global spread of Chinese standards. Further, the U.S. blockade of China, which put forward Trump's second "America First" policy, is expected to further strengthen its strategic clarity and pressure (Gyu and Yeon, 2024). Trump's second term defines China as the biggest threat and an enemy that must be beaten, frames U.S.-China competition as a contest to win, not merely manage and is expected to pursue "strategic decoupling".

The standard competition between the U.S. and China now has escalated into a high-stakes contest between the two countries. Also, a clear bloc pattern has emerged around the U.S. and China. The U.S. is attracting Europe and Japan to the union, and China's Huawei signed a contract to install 5G networks in Russia (Congress, 2025). In the future, the standard competition field is expected to expand to the entire technology of the Fourth Industrial Revolution, which will represent the next-generation future industries. In this regard, there is a possibility that the global standard system can be decoupled along with technology decoupling or global supply chain decoupling. This means that separate high-tech or global supply chains may emerge based on divergent standard systems. Since standardization is a basic means to promote trade and interoperability, trade and technological innovation may become fragmented if the global standardization system breaks apart.

3.3. Global Supply Chain Competition

Prior to the U.S.-China technology hegemony competition, the global economy focused on the global value chain rather than the global supply chain. However, the global shutdown of factory operations due to the COVID-19 pandemic was an opportunity to realize the severity of the crisis caused by dependence on global value chains, which relies heavily on certain countries such as China (Kumar et al., 2020). As a result, many companies have shifted from a global value chain that emphasized efficiency such as cost reduction to a global supply chain-based strategy that secures the stability of the supply of parts or technology. The U.S. technology control to China, triggered by Huawei, was intended to counter China's advancement in key technology areas such as 5G, semiconductors, and artificial intelligence and to exclude China from the global value chain. Accordingly, the U.S. is pursuing a strategy to build a new global supply chain such as onshoring, reshoring, nearshoring, and friendshoring to address vulnerabilities in critical manufacturing supply chains.

In response to such U.S. actions, China is seeking to establish a global value chain centered around itself (Grimes and Du, 2024). In order to reduce its dependence on the U.S., China is seeking to promote mutual economic cycles at home and abroad by expanding domestic demand and reducing the capacity of domestic companies and industries. In addition, in major strategic high-tech industries, China is pursuing a strategy to establish a national value chain (NVC) through technological and capital expansion and a red supply chain (RSC) to localize major components and materials for producing finished products (Grimes and Du, 2020). The global supply chain is facing a crisis and the global value chain is weakening further as global protectionism has been strengthened due to the impact of the COVID-19 pandemic. In particular, the U.S. has recognized the high dependence on China in the semiconductor sector as a serious national security threat and pushed for a global supply chain reorganization policy that strengthened sanctions against China. In addition, China is pushing for the reorganization of the existing global value chain by restructuring the economy to focus on domestic demand and enhancing technological competitiveness (Kratz et al., 2025). As decoupling occurs over technological hegemony between the U.S. and China, the securitization of economic issues is also becoming increasingly prominent.

4. The Characteristics of U.S.-China Decoupling and the Possibility of Dividing the World

4.1. The U.S.-China Decoupling Trend and Its Aftermath

Although the effects of U.S. decoupling from China, which began in earnest after the Trump administration, varies somewhat depending on the statistics publishing agency, it is true that signs of the negative aftermath of the decoupling are relatively clear through several reports. In

2022, the volume of trade between the two countries hit an all-time high, though interdependence has declined amid growing decoupling (García-Herrero, 2022). The share of trade between the U.S. and China has been decreasing over the past four years since 2017, before the trade war. In other words, the share of U.S. trade with China decreased from 16.6% in 2017 to 13.5% in 2022, and China's share of trade with the U.S. decreased from 14.3% in 2017 to 12.5% in 2022 (Soltani, 2025). Regarding this trend, the report analyzed that it stems from sanctions imposed in 2018 during the height of the trade conflict.

Comparing the export trends of China, the EU, and India to the U.S., China's exports to the U.S. have been on a sharp decline for six months since September 2022, especially for five consecutive months from October of the same year to February 2023, with February 2023 exports to the U.S. plunging by 27.5% (Bao, 2025). Major Chinese research institutes are also acknowledging China's declining exports to the U.S. and emphasizing the need for countermeasures. In a report released at the end of February 2023, the Bank of China Research Institute under the Bank of China, one of China's major banks, said that China's exports to the U.S. stand out amid the global economic downturn in the second half of 2022 and added that the initial phenomenon of U.S.-China economic decoupling is occurring. An IMF report released in January 2023 predicted that trade restrictions caused by decoupling could reduce global GDP by 7%, and that if technological decoupling were added, GDP losses could reach 8-12% (Reuters, 2023). In this context, the IMF economist pointed out that a world divided into quarters due to decoupling is likely to be a poorer one.

The US-China economic decoupling is still in its infancy, so evaluations and prospects are mixed, but at least in the high-tech sector, it is expected to encounter major obstacles. However, globalization, which was strengthened through interdependence with global economic networks due to the "security of high-tech competition, weaponization of economic interdependence, restructuring of supply chain reduction and economic blockification," is receding as strategic competition between the US and China shifts or spreads from trade and high-tech to ideological and value fields. Therefore, the technology decoupling issue between the US and China is emerging as a key factor in shaping the future international order (Haar and Yang, 2024). If decoupling is driving changes in the international order on microscopic aspects such as manufacturing and high-tech fields, it is questionable whether the world is headed for long-term macro-level fragmentation.

4.2. The Future of Decoupling: Tax Evasion and the Division of the World?

Complete decoupling between the U.S. and China represents a return to global polarization. If the Cold War polarization in the past was centered on the U.S. and the Soviet Union, the future is the new Cold War polarization centered on the U.S. and China. In 2019, Farrell and Newman,

who theorized the weaponization of interdependence, pointed out that the U.S.-China decoupling is an attempt to separate the "Siamese twin" concept connected by neural tissues, common organs, and shared circulatory systems (Ford, 2024). Joseph Nye pointed out that the Great Decoupling is a misleading reality, because it can involve enormous economic costs. In addition, many commentators suggest that complete decoupling is undesirable as it would result in significant economic losses for both countries (Nye, 2020).

Amid conflicting evaluations and prospects surrounding decoupling, many point out that selective or partial decoupling is unlikely. The U.S. and China are likely to continue decoupling technologies to reduce their dependence on and vulnerability to other countries, focusing on core technologies, which are sources of future competitiveness and sensitive industrial sectors. There are disagreements about the degree of decoupling, but there seems to be little disagreement that decoupling reorganizes the U.S.-China economic relationship and changes the global economic order.

After 'globalization', which began with easing trade barriers between countries more than 40 years ago, 'super-globalization', the accelerated and deeper integration of economies worldwide, due to the spread of FTAs (Free Trade Agreements), digital technological innovations, and global supply chains have contributed to in-depth integration that improves economic efficiency (Smith, 2016). However, due to the U.S.-China trade war, the COVID-19 pandemic, and Russia's invasion of Ukraine, 'de-taxation' has become a reality. As interdependence began to be used as a political weapon in earnest, the globalization paradigm is shifting toward de-globalization and economic fragmentation.

If decoupling cannot be halted, the world may be divided. This is because the decoupling between the U.S. and China has shaken the global supply chain and deepened and spread geopolitical conflicts over global hegemony, while also forming a confrontation between liberal democracies and authoritarian countries (Chukwuma et al., 2024). In the divided world, mutual distrust, control, monitoring, and censorship will deepen and spread, and free, open, safe and reliable economic, knowledge, and cultural exchanges will inevitably shrink.

We may live in a divided world in the future. One world will be built on policies of multilateralism, multiculturalism, and pragmatism, and the other world built on the principles of unilateralism, monoculture, theology, and ideology. One system will work with the vision and policies of One Belt, One Road, 5G, ecological civilization, poverty alleviation, and 'humanitarian community.' The other system will focus on the vision of dollar hegemony, big tech monopoly, fossil fuel promotion, continuous poverty spread, and 'America First.' There would essentially be two worlds on one planet. However, as globalization is not dead-it is changing, the task for the future economy is to prevent the regression of globalization and

promote 're-globalization' as a better globalization. Returning to the problem consciousness of the introduction, the challenges facing humanity today are not problems that can be solved at the level of individual countries. They require a joint response from the global community and humanity as a whole. Therefore, the future of globalization is to establish open and fair rules and norms to continue the positive aspects of re-globalization while creating an inclusive economic and technological ecosystem at home and abroad and to reinforce the stability and resilience of supply chains (**der Marel, 2025**).

5. In Place of the Conclusion: The Symbiotic Implications of the Future Economy

Economic decoupling will divide the world into an economic system centered on the U.S. and China, and globalization, which has continued since the post-Cold War, can make the future economy grim by bringing about the division of the world through fragmentation and bloc formation, far beyond trade-related disputes. Furthermore, if decoupling spreads to the areas of military, security, ideology, and values, the world will enter an era of division and the deepening and spreading of nationalism will lead to a fragmented world. Even if it is not competition for technological defeat between the U.S. and China, humanity and the world are currently facing a transnational threat due to a global complex crisis. To solve these problems, efforts are needed to bring about cooperation for coexistence beyond conflict, through a perspective of symbiosis. The symbiosis perspective can be a major principle of international cooperation in response to the transnational threat facing humanity. The division or fragmentation caused by decoupling cannot overcome this crisis. Based on the value of symbiosis, it is necessary to create new rules and norms of 're-globalization', which enables sustainable development.

Symbiosis is also a universal principle in which various economic, social, and political actors evolve and develop. The evolutionary 'winner-take-all' principle rooted in fierce market competition. It has been regarded as a universal law that countries with a vital understanding in their national interests prosper if they win infinite competition for limited power and resources and decline if they lose. However, globalization over the past 40 years has plunged the global economy into a 'boomerang effect' in which cutthroat competition is turning interdependence into a weapon, adding to the uncertainty of the future economy and leading to a more unstable and unequal world. Considering the future economy in the era of the Fourth Industrial Revolution, it is necessary to seek the direction of re-globalization based on cooperation and symbiosis, not evolutionary globalization of survival of the fittest. Human society does not work only with infinite competition and survival struggles. Even in view of Lynn Margulis' scientific achievement that argued for symbiosis as a key principle of evolution through her theory of serial endosymbiosis, human society or the market economy should not be described as a stage for selfish humans' survival competition. In this context, the self-evident fact that cooperation and symbiosis are other principles of evolution, not just competition, is important in that it can be a

rudder for re-globalization as a new future beyond zero-sum competition. Symbiosis from a religious perspective is in contact with a universal perspective to some extent in that it can be linked to symbiosis from a scientific perspective. Therefore, it is difficult to deny that the symbiotic future economy provides ideas for coexistence between humankind and the world. In addition, in that symbiosis is the path to a just community based on true love, it is also in line with Rousseau's idea, which suggested 'competition based on love' as an alternative rather than blind competition. All societies that have existed have dreamed of a better society and a happier community. The fundamental search for a new society is possible only on the premise of criticism and reflection on the serious problems facing a society at a given time. Today, criticism and reflection on the competition for technological hegemony and the resulting issue of the possibility of division of the world prompt one to dream of a better society and a happier community from a symbiotic perspective. In that respect, philosophy and thought are milestones for a better future society and a happier future community.

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