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Analysis and Measures to the Tightening of U.S. Export Control

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Abstract

The expansion of the scope and extraterritorial effect of the United States' export control poses a serious and realistic challenge to China's technology, industries, enterprises and macro-economy. This article systematically reviews the historical evolution and the latest legislative trends of the U.S. export control legal system, deeply analyzes its institutional expansion paths such as "long-arm jurisdiction", technology traceability and supply chain control, and reveals the essence of maintaining technological hegemony through legal technical means. By comparing the differences in the export control systems, the limits of extraterritorial effect and the enforcement systems, it contrasts the differences between the U.S. and China's export control legal systems. In response to the practical challenges such as the expansion of the control scope, the sharp increase in compliance costs and the impact on the safety of the industrial chain, it proposes three countermeasures: enhancing independent innovation capabilities, improving China's export control legal system and strengthening international supply chain cooperation, to achieve a transformation from passive defense to rule leadership and ensure national technological security and high-quality industrial development.

Keywords

Export Control, Extraterritorial Effect, Foreign Trade Law, Long-Arm Jurisdiction

1. The Presentation of the Problem

In recent years, the escalating export control measures implemented by the United States have not merely been a competition at the technical level; they have also become a complex game involving laws, supply chain security, and the future dominance of technology. Traditional geopolitical competition is being replaced

by technological competition.

The export control measures of the United States have shown an unprecedented "tightening" trend. In recent years, the US's export control policies towards China have evolved from sporadic and case-specific measures to a systematic, all-round, and escalating long-term strategy. At the same time, the scope has been continuously expanding, from initially individual enterprises (such as HUAWEI, ZTE, etc.) to the entire semiconductor industry chain (EDA software, lithography machines, advanced chips), artificial intelligence (high-performance GPUs), aerospace, biotechnology and other multiple high-tech fields. For instance, since 2022, the Bureau of Industry and Security of the US Department of Commerce (BIS) has included AI chips, advanced semiconductor manufacturing equipment and related technologies in the specific export control classification number, becoming a key controlled object.

In 2025, the United States introduced the "50% rule", extending the list of entities to include unlisted subsidiaries where the holding percentage is 50% or more, to plug the loopholes of "shell trading". The United States strengthened the review of "final use" and "final users", requiring exporters to fulfill higher due diligence obligations for third-country transshipment and Hong Kong SAR transit routes, and even imposing licensing requirements on Chinese companies that use American cloud computing power to train AI models. The "AI diffusion rule" (though postponed) was first proposed in 2025 to implement export control on the weights of AI models themselves, marking a shift from "controlling products" to "controlling algorithms" and "controlling capabilities" for the United States, with the regulatory logic expanding from "items" to "technical capabilities".

The United States has continuously intensified its export control measures, leveraging the "long-arm jurisdiction" rule. It not only restricts American enterprises but also, through the "Foreign Direct Product Rule" (FDPR) and other means, coerces enterprises worldwide that use American technologies and equipment (such as TSMC and ASML) to comply with its control requirements, achieving a "global containment" strategy. The United States attempts to unite its allies (such as Japan, the Netherlands, and South Korea) to jointly implement control measures, establishing the "Chip Four Alliance" (CHIP4), aiming to exclude China from the global advanced supply chain. At the same time, through tools such as the "Entity List" and the "Unverified List", it precisely targets specific enterprises and research institutions, cutting off their access to critical technologies and equipment. Legislation has also been continuously strengthened through domestic legislation such as the "Chip and Science Act" and the "2023 Fiscal Year National Defense Authorization Act", providing a solid legal foundation and substantial financial support for export control, elevating it from administrative measures to a national strategy.

The tightened export control measures by the United States have had multi-dimensional and deep-seated impacts on China. The "supply chain bottleneck" risk has intensified. In areas such as high-end chips and advanced manufacturing

equipment, Chinese enterprises are facing direct risks of supply chain disruption, which affects the normal operations and research and development processes of leading enterprises like Huawei and SMIC. The security of the industrial chain is threatened. The trend of "decoupling and disconnection" in the global supply chain has forced China to restructure an independently controllable industrial chain, but this requires huge investment and a long time, and the cost is high in the short term. Scientific and technological innovation has been hindered. The difficulty of obtaining advanced technologies and equipment has increased, affecting the research and development speed and innovation capabilities of China in fields such as artificial intelligence and supercomputing. The compliance costs for enterprises have skyrocketed. Chinese enterprises face complex compliance requirements in global operations. A slight mistake may lead to a violation of US laws, resulting in huge fines and business disruptions.

In summary, the tightening of US export controls is a defensive legal strategy adopted by the country to maintain its technological hegemony after feeling the pressure of systemic competition. This action has led to a series of problems in reality, such as administrative inefficiency, industrial backlash, and global supply chain chaos, and has also received equal countermeasures from China and other countries. Against this backdrop, asking the questions "Why is it tightening and how to respond?" is not only a legal compliance requirement, but also a practical issue related to national strategy, industrial security, and the survival and development of enterprises.

2. Changes in U.S. Export Control Laws and Evolution Trends

Export control has always been an important issue in the development of economic and trade legal relations between China and the United States. For reasons such as safeguarding national security, maintaining the dominant position of the economic market, sanctioning competitors, and promoting foreign policy, the export control regulations of the United States have become increasingly strict. When tracing the legislation of U.S. export control, it can be divided into three main stages.

2.1. The Embryonic Stage of the United States' Export Control System

Tracing back to the eve of the American War of Independence, the export control measures in the United States had already begun to take shape. The Continental Congress of the North American colonies passed the 1774 "Articles of Association", declaring a ban on exporting any products to Britain and its colonies. The main purpose was to resist the oppressive colonial rule of Britain (Bartlett III & Poling, 2016).

In December 1807, the US Congress passed the "Embargo Act", prohibiting all ships from leaving the United States and heading for foreign ports, in order to address the strong anti-British sentiment among Americans at that time and to

prevent the United States from getting involved in the Anglo-French war (Marcuss & Zara, 2016). Following the American-British War of 1812-1815 (also known as the "Second War of Independence"), the US authorities realized the importance of developing manufacturing industries and also promoted the development of trade protectionism. Considering national security, the United States eventually passed the first protectionist tariff act, namely the "1816 Tariff Act". Since 1917, the US government has implemented export control on military items based on the "Trading With the Enemy Act of 1917" (TWEA), which is a federal law based on jurisdictional protection and has the effect of "long-arm jurisdiction". Thus, the jurisdiction of US law began to transcend national boundaries.

2.2. The Modern System of Export Control Laws in the United States

The U.S. export control system began in 1940 with the "Export Control Act of 1940" (ECA 1940), which empowered the president to prohibit or restrict the export of military equipment, military supplies, and related items when "national security interests required" during World War II. The scope of control expanded to civilian items during this period. In 1949, the "Export Control Act of 1949" (ECA 1949) was enacted. With the deterioration of U.S.-Soviet relations and the outbreak of the Cold War, export control became a long-term policy and was the first attempt by the United States to establish a permanent export control system. It was implemented to "protect the domestic economy, advance foreign policy, and ensure national security." For foreign individuals or entities located outside the United States who legally export items from the United States, they are likely to face lawsuits and sanctions for violating U.S. export control regulations. During this period, export control showed an extraterritorial nature. During the same period, in order to enhance the effectiveness of control measures, the United States and its European allies established the Paris Coordinating Committee for Multilateral Export Controls (COCOM) in 1949 to coordinate the export control policies of member countries towards socialist bloc countries, and to prevent strategic materials and technologies with military applications from flowing to their adversaries. The export control legislation and enforcement mechanisms from 1940 to 1960 effectively prevented the Soviet and Eastern Bloc countries from obtaining Western high-tech, and also became the theoretical basis for current cross-border trade compliance. Whether it is the licensing process, final use inspection, or international cooperation mechanism, this historical framework still has a profound impact on the current US Department of Commerce and law enforcement agencies (Sun & Hu, 2025).

The export control legal system of the United States is mainly composed of two fundamental laws: One is the "Export Administration Act" (EAA) which was formulated and promulgated in 1979 and developed on the basis of the "Export Control Act" of 1949. It mainly focuses on the export control of dual-use items and emphasizes the importance of exports to the economy, restricting export control to the necessary national security scope. It also emphasizes authorizing the export

control of goods and technologies with significant military impact, while authorizing the adoption of necessary export control measures based on the United States' foreign policy goals, reaffirming the export management of strategic shortage technologies and materials. The other is the "Arms Export Control Act" (AECA) which was formulated and promulgated in 1976 and mainly focuses on the export control of military items. Therefore, in the United States' export control system, dual-use items and military items have their own independent licensing approval systems. In addition, the United States' export control legal system also includes laws such as the "Atomic Energy Act" and the "Nuclear Non-Proliferation Act of 1978" that the United States Nuclear Regulatory Commission and the United States Department of Energy refer to when regulating nuclear products.

The diplomatic initiatives of the Nixon administration in the United States marked a new era in Sino-US relations, with relatively lenient and easing export controls towards China. Subsequently, the US trade deficit continued to expand in the 1980s. The US BIS, based on the ECA 1979 authorization, formulated implementing regulations as the main legal framework for implementing military-civil dual-use item export controls. This not only enhanced the transparency of export control policies but also relaxed some export control measures. In December 1981, the United States introduced the "China-US Export Control Procedures Act", and subsequently promulgated the "General Guidelines for the Processing of Dual-Use Items", which led to a more relaxed export control towards China. In 1988, the Comprehensive Trade and Competition Act made significant revisions to ECA 1979, expanding the scope of the clause allowing foreign access to US-origin military-civil dual-use items and extending this regulation to include countries that are not members of the Paris Coordinating Committee (Coordinating Committee for Multilateral Export Controls, COCOM) (Zheng, 2023). After 1989, as the US Congress was unable to reach a consensus on continuing the reform of the ECA, successive presidents have exercised the power of export control by invoking the International Emergency Economic Powers Act (IEEPA) of 1977 and signing executive orders. The IEEPA is not applicable only in times of national emergency. After several decades of development, the IEEPA has become an efficient policy tool that can significantly expand the president's power within a short period of time and can be cross-used and integrated with US export control, economic sanctions, trade and investment restrictions, etc. To this day, the IEEPA has provided a legal basis for dual-use item export control and the Export Administration Regulations (EAR). Although the US Congress has the constitutional right to trade policy, the IEEPA has granted the president overly broad discretionary power.

2.3. Modernization and Precision Reform of U.S. Export Controls

Since Obama took office as the president in 2009, a new stage of US export control towards China has been initiated. The Obama administration launched the "Export Control Reform Initiative" (ECRI), and the cabinet began to reform the ex-

isting export control system, aiming to establish an efficient and clear export control system. In December 2010, the US released an export control reform draft, but this draft did not fundamentally change the discriminatory US export control policy towards China. In June 2011, the US Department of Commerce issued new export control policy regulations, the "Strategic Trade License Exception Regulations", excluding China from the 44 countries and regions that can enjoy trade facilitation measures. This means that currently the US still regards China as an object subject to strict export control.

The EAA was further modified through three amendments to the "1979 Export Administration Act of 1981 Amendment", "1979 Export Administration Act of 1985 Amendment" and "1988 Comprehensive Trade Competition Act". It incorporated elements such as public health, environmental protection, vigilance against Soviet technology theft, and prevention of excessive reliance on energy. Whenever the EAA expired, the president reauthorized it based on the IEEPA. The EAR initially relied on the IEEPA's authorization to maintain its validity, and this practice has been supported by the courts.

The "Export Control Reform Act of 2018" (ECRA) is the superior law and formal legislative basis of the EAR, providing a detailed legal foundation for the US government to implement dual-use export control for military and civilian purposes, and clarifying the control purposes and the authority of BIS. ECRA requires the president to control "the export/transfer/interstate transfer of items under US jurisdiction". This act requires the Department of Commerce to establish and maintain a list of controlled items; establish a list of foreigners and end-users who pose a threat to US national security and foreign policy; require the implementation of the export license system; and prohibit unauthorized exports/ re-exports/transfers of controlled items. On August 19, 2025, the US President signed the "Maintaining American Superiority by Improving Export Control Transparency Act" (hereinafter referred to as "the new law"), which officially became law. The new law revised ECRA2018, requiring the US Secretary of Commerce to submit reports to Congress every year on the application and implementation of export license for controlled items. According to the new law, BIS must submit reports to Congress every year on the following matters: namely, exports, re-exports, technical disclosure, and intra-state transfers involving items under US export control rules; applications for licenses from specific controlled entities, law enforcement actions, and other authorization requests. Here, "controlled entities" refer to any entity that meets the following conditions: 1) conducts business activities in or within the countries and regions included in Group D:5 (including the People's Republic of China and the Hong Kong Special Administrative Region); and 2) is included in the "Entity List" or "Military Final User List". The new law is likely to lead the US government to further strictly review and approve the export licenses for controlled items such as GPUs and emerging fields to China, and increase the investigation and punishment of possible illegal acts.

Looking back at history, the legislation on export control in the United States

has been a dynamic process of constantly seeking a balance among "national security", "foreign policy" and "economic interests" (Yu, 2000). Its evolution path clearly demonstrates that, in response to the changes in the international landscape and technological advancements, the United States is continuously using legal means to precisely restrict the dissemination of items and technologies that it deems may pose a threat to its national security and technological superiority.

3. The Core Issues of the Strengthening of U.S. Export Control Laws

In the Trump 1.0 era, the United States' export control policies towards China were comprehensively upgraded and showed a trend of concentrating on high-tech fields such as chips. In February 2024, the National Science Council of the United States updated the list of general critical and emerging technologies, including 18 fields such as advanced computing, advanced manufacturing, artificial intelligence, clean energy, semiconductors and microelectronics. During the 2024 presidential campaign, Trump proposed policy propositions to expand the scope of export control and strengthen the intensity of restrictions, including implementing customized restrictions based on different industrial sectors and departments; strengthening the monitoring of the flow of US export products and implementing mandatory inspections on the final uses of export products; raising the level of export restrictions on China and expanding the scope of export restrictions on third-country goods for China; and including more Chinese military-civilian integration product manufacturing enterprises and entities such as WeChat and Douyin, which are mobile applications, in the entity list. In the Trump 2.0 era, the technological competition between China and the United States has become more intense, and the United States has launched more extensive and more targeted export control measures against China.

3.1. The Scope of U.S. Export Controls Has Expanded

The scope of U.S. export control is regulated through three dimensions: controlled items, controlled behaviors, and destination/end-user/end-use. Among them, the items subject to the Export Administration Regulations (EAR) are very extensive, including: 1) dual-use items, which refer to items that can be used for both civilian and military or weapons of mass destruction purposes, mostly listed on the Commerce Control List (CCL) and managed according to the Export Control Classification Number (ECCN); 2) foreign direct products, which refer to items manufactured abroad but are "direct products" of specific U.S.-origin technology or software, or items produced by major equipment using specific U.S. technology or software; 3) foreign products containing U.S. components, foreign-made products that contain controlled U.S.-origin components and exceed the "de minimis" threshold, usually 25%, but for certain sensitive items or destinations, it could be 1% or 10%, are also subject to EAR jurisdiction; 4) other (EAR99) items, which refer to items not listed on the CCL but still subject to EAR jurisdiction, mostly

low-tech consumer goods. Although in most cases, export licenses are not required, if they involve embargoed countries, specific end-users or end-uses, licenses must still be applied for. The controlled behaviors under EAR mainly include: 1) export, which refers to the actual shipment or transmission of items from the United States, as well as the disclosure of technology or source code to foreigners within the United States (treated as export); 2) re-export, which refers to the transportation of items subject to EAR jurisdiction from one foreign country to another, or the disclosure of technology to non-residents of the country (treated as re-export); 3) domestic transfer, which refers to the change of the end-user or end-use of controlled items within the same country. Destination control is determined based on the Commerce Country Chart (CCC), combined with the ECCN code of the item and eight control reasons, such as national security, nuclear nonproliferation, and counter-terrorism, to determine whether a license is required for exports to specific countries. Countries are classified into groups A (strategic partners), B, D (countries of concern, such as China), and E (countries designated by the United States as supporting terrorism, such as Iran), with the degree of control gradually increasing; end-user and end-use control involves BIS establishing various lists, such as the Entity List, Military End-User List, Denied Persons List, Unverified List, etc., imposing strict restrictions or presumptive denials on transactions involving entities on these lists. Additionally, it is prohibited to provide support to transactions involving prohibited end-uses, such as nuclear, biochemical weapons activities, etc., if it is known.

Specifically, the "Commercial Control List" (CCL) managed by BIS includes 10 categories of items under control, covering key technical fields such as nuclear materials, electronic equipment, and information security, and is further classified through ECCN. Items not included in the CCL may still be classified as EAR99 and require a basic review. On September 29, 2025, BIS published a temporary final rule in the Federal Register titled "Expansion of End-User Controls to Cover Affiliates of Certain Listed Entities", officially introducing the "50% rule", which automatically extends the effectiveness of export control measures for entities on the entity list, military end-user list, and specially designated nationals list (Specially Designated Nationals and Blocked Persons List, SDN List) to unlisted affiliated companies that collectively hold 50% or more of the shares of the listed entities[1]. This change marks that the compliance of U.S. exports has officially shifted from the traditional "list screening" model to the "structural compliance" model that requires equity penetration. This also further expands the scope of the regulated entities.

The introduction of these relevant rules fully demonstrates the United States' intention to comprehensively strengthen export control regulations, especially to tighten the export control restrictions for specific entities.

3.2. Extension of Extraterritorial Jurisdiction

The US Congress has enacted increasingly broad federal laws, which serve as the

[1]https://public-inspection.federalregister.gov/2025-19001.pdf.

legislative basis for the US to impose legal sanctions abroad. The US export control system extends its jurisdiction to foreign-made products through the principle of technical traceability and the minimum proportion rule, thereby forming a "long-arm jurisdiction" with extraterritorial effect. The "long-arm jurisdiction" rule in US law is a concept from civil procedure law, meaning that in civil litigation, for defendants who are not residents or legal entities of the state or even of the country, as long as there is a "minimum connection" between them and the court location, the court of that state can exercise jurisdiction over them (Huo, 2025). For instance, having a branch in the United States, using the US dollar for settlement or for other financial services, or utilizing the US email system all constitute "minimum connection".

The core of the extraterritorial effect clause set by the United States lies in defining the connection between the adjusted object and the country. [Liao Shiping: "The Extraterritorial Application of Chinese Law: The Perspective of Administrative Law Enforcement", published in "Administrative Law Research" in 2023, Issue 2, page 57.] The "Foreign Direct Product Rule" (FDP rule) is the most typical manifestation of the extraterritorial effect of the United States' export control. Even if a product is completely produced outside the United States, as long as it is a direct product based on the "technology" or "software" of the United States, or a product manufactured using facilities/equipment based on American technology, this product will be "treated as" a product of the United States and fall within the jurisdiction of the United States' export control law. The "50% rule" is highly penetrating and has completely changed the previous regulatory standard based on "independent legal entities", essentially spreading the effect of the United States' sanctions list like a virus to the associated enterprise network. Many enterprises not directly listed may become "hidden" restricted entities due to their equity connections and enter the domain under the jurisdiction of the United States, achieving an exponential expansion of jurisdiction. The SDN List is also one of the tools used by the United States to realize extraterritorial jurisdiction. It is managed by the Office of Foreign Assets Control of the United States Department of the Treasury based on multiple sanctions laws (such as the IEEPA, etc.), and is used to list individuals and entities subject to comprehensive sanctions by the United States[2]. Being included in the SDN list means that as long as a certain action (regardless of where it occurs) has a "substantial effect" on the interests of the Americans (Substantial Effect), the United States has the right to exercise jurisdiction over it. This restriction scope is extremely broad, covering comprehensive prohibitions on direct or indirect exchanges of funds, goods, technology and services, and the practical effect is to exclude SDN entities from the international financial and trade system, expanding jurisdiction from the general "territorial jurisdiction" to the "effect principle".

[2]https://research.mit.edu/security-integrity-and-compliance/foreign-engagement/regulations-and-references/entity-list-and#:~:text=The%C2%A0SDN%20list%C2%A0contains%20names%20of%20individuals,some%20universities%.

The "long-arm jurisdiction" mechanism of the United States is a complex system with numerous rules, integrating legislative power, administrative law enforcement power and judicial power. It is a dynamic operational system gradually formed by the long-term mutual support, mutual reliance and mutual cooperation among the national power organs of the United States in practice. At the same time, this mechanism exerts actual deterrent and destructive power, ultimately relying on the hegemony or leading position of the United States in areas such as currency payment, settlement, and technology, as well as the market scale advantage of the United States as the largest developed economy in the world. Its core logic is to incorporate the global industrial chain into the legal order of the United States through legal technicalization (such as FDPR, notification letters) and pre-enforcement (such as proactive investigations, fishing law enforcement). Enterprises are no longer merely facing "compliance costs", but rather "institutional uncertainty"—even if transactions occur entirely in a third country, they may still be held accountable due to "technical traceability" or "notification letters".

3.3. Technological Hegemony and Supply Chain Control

The essence of the tightening of U.S. export control laws is to transform technological advantages into institutional power, achieving technological lock-in and standard monopoly. The U.S. has included AI chips, EDA tools, semiconductor manufacturing equipment, etc. in the "Emerging and Basic Technologies" list through the EAR. In March 2025, the BIS placed 54 Chinese entities on the export control "Entity List", mainly targeting areas such as artificial intelligence, supercomputing, aviation, and nuclear energy. Through the "50% rule" of the BIS, it also conducts downward equity penetration, including overseas companies that were not originally listed in the EAR jurisdiction system, further expanding the effectiveness of the U.S. domestic law in the global supply chain. This demonstrates a strong legal precision strike characteristic and aims to use the legal path to establish U.S. technological hegemony.

Meanwhile, the "Act to Maintain U.S. Advantage by Enhancing Export Control Transparency" in the United States has established a systematic and transparent review mechanism, significantly increasing the uncertainty and compliance costs for conducting business with entities regarded by the United States as "risky". For some multinational companies, this means that their supply chains, customer lists, and technological collaborations could all become the targets of congressional review. The potential legal, reputational, and economic penalties risks are something that cannot be ignored. The extraterritorial application of U.S. export control laws has led to an increase in the uncertainty of global business activities. In its 2025 guidelines, the BIS reminded the industry to be aware of the risks of using advanced computing chips from China (especially Huawei's Ascend chips), which may have been developed or produced in violation of U.S. export control regulations. The BIS warned that, according to General Prohibition 10 (GP10), using

such Chinese advanced computing chips may violate U.S. export control regulations and could subject companies to BIS enforcement actions. The far-reaching impact of this regulation lies in that it forces any global company using Chinese chips to face the risk of U.S. sanctions, essentially forcing global enterprises to take sides and fragmenting the global supply chain system.

Take semiconductors as an example. The semiconductor industry has become the primary battlefield for the US to curb China. Starting from the very source of chip design, it aims to prevent China from making breakthroughs in the semiconductor field, thereby maintaining the US's position at the top of the technological pyramid and its control over the semiconductor supply chain. On May 13, 2025, the BIS announced the abolition of the artificial intelligence diffusion rules of the Biden administration and strengthened measures for global semiconductor export control[3]. In terms of internal checks and balances, the United States has allocated 52.7 billion US dollars through policies such as the "Chip and Science Act" to support the cause, and has vigorously promoted private investment to build advanced chip factories, support the construction of the "National Semiconductor Technology Center", accelerate technological innovation, and implement external checks and balances. In this regard, the United States has established the "Chip Alliance" to integrate the resources of its allies, restrict China's development in the chip ecosystem, and rely on its advantages in chip design and intellectual property rights to curb the competitiveness of Chinese products (Huang & Shao, 2025). The US's regulatory measures targeting the semiconductor industry have increased the possibility of triggering global semiconductor supply chain disruptions, disrupting the global semiconductor supply chain. This not only affects the production of semiconductor industries in other countries, but also adversely affects the US itself, causing production shortages and delays as well. In various sectors such as automobiles, consumer electronics and telecommunications, there have been shortages of key components, production delays and increased costs. This has had a negative impact on the supply chain globally (Insook, 2025).

4. Comparative Study of U.S. and Chinese Export Control Laws

4.1 The Characteristics of the U.S. Export Control Laws

1) Overview of the U.S. Export Control Legal System

The export control system in the United States already has a relatively mature legislative foundation and a complete set of sanction tools. The implementation process of relevant sanctions is relatively short and they can be put into effect more quickly, making it one of the early anti-China policies launched by Trump's 2.0 era.

Over the years, the main objective of the US export control policies has shifted from preventing the proliferation of weapons of mass destruction, machines and

[3]Department of Commerce Announces Recission of Biden-Era Artificial Intelligence Diffusion Rule, Strengthens Chip-Related Export Controls. https://www.bis.gov/press-release/department-commerce-announces-recission-biden-era-artificial-intelligence-diffusion-rule-strengthens-chip.

transportation tools to consolidating technological hegemony, maintaining technological leadership, and becoming a means to suppress competitors. According to the current US export control legal system, it is structured in three layers: the top-level main legislation: ECRA and IEEPA serve as the permanent legal basis; the middle-level rules: EAR and the International Arms Trade Regulations (ITAR) are the specific implementation details; the bottom-level list: the BIS list and guidelines serve as dynamic control tools. The top-level legislation permanently incorporates the EAA content, establishing a long-term legal framework, marking the upgrade of export control from a temporary measure to a national strategic tool. The US export control mainly consists of two types: one is ITAR for military products, and the other is EAR for dual-use military and civilian products. Within the scope of EAR, the products under jurisdiction can be divided into a less controlled category: classified as EAR99 (such as an American-made pen) and products with ECCN codes (such as an American-made chip, whose ECCN code is 3A001, and exports to China require a license). The setting of ECCN codes is to distinguish the license requirements of different products, and EAR99 corresponds to this. Export to countries other than the United States does not require a license. The specific classification description of ECCN codes is listed in the "Commodity Control List" of the supplementary part of EAR Article 744 of the Ministry of Commerce[4]. If the product under the jurisdiction of the EAR does not fall under any of the circumstances listed in the "Control List of the Ministry of Commerce", then its classification will be EAR99.

2) Collaboration of Legislative and administrative behavior

The enforcement of U.S. export control presents a feature of multi-departmental collaboration and proactive enforcement. The main mechanisms include: BIS is responsible for dual-use item licensing and civil enforcement, by issuing "informal letters", implementing "implicit licensing requirements" for specific transactions; the U.S. Department of Justice (DOJ) or the Federal Bureau of Investigation (FBI) is responsible for criminal investigations and prosecutions, coordinating cross-departmental actions through the "National Export Enforcement Initiative" (NEEI), and in 2023, adding 25 prosecutors dedicated to export cases; ICE is responsible for border enforcement and goods seizure, implementing "pre-export interception", seizing suspicious goods at global ports; EECC is responsible for cross-departmental coordination, reviewing all export license applications to prevent "license arbitrage" and "avoidance transactions", etc. In addition, the United States is promoting the transformation of the "proactive enforcement" model. The draft of the "Sanctions and Export Control Enforcement Act" in 2025 proposes authorizing private institutions to participate in investigations, even allowing them to conduct "fish-and-take" style nominal transactions to monitor the fund flows of sanctioned entities in real time.

Based on the available public information, whether it is the current BIS director,

[4]https://www.ecfr.gov/cgi-bin/text-idx?SID=8cf01af0fcc1bc1c9804c2f2258e380e&mc=true&node=pt15.2.774&rgn=div5#ap15.2.774_12.1.

the Deputy Secretary of Commerce Jeffrey Kessler, or Landon Heid who has been transferred to the White House National Security Council, or David Peters, the nominated Assistant Secretary of Commerce who is said to be likely to be in charge of the overall law enforcement of BIS in the future, the biggest difference between the new BIS management team and the BIS during the Biden administration is that they do not want to allocate a large amount of BIS's working time to the formulation of grand and lengthy rules (such as the previous AI Diffusion Rule), but rather concentrate more resources on the enforcement aspect to enhance the deterrent power of export control supervision. Therefore, the BIS not only strives to increase the budget for law enforcement and supervision by nearly double next year, but also will promote its administrative legislation in a coordinated manner to force relevant enterprises to invest more resources in compliance control to cooperate with the BIS's law enforcement measures. The formulation of the "50% rule" is a clear manifestation of this shift in thinking.

On July 21, 2025, the US House of Representatives voted to pass the "OFAC Investigator Licensing Act" (OFAC Licensure for Investigators Act, H.R. 1450). This bill proposes to establish a pilot program within the framework of the US Department of the Treasury's OFAC, allowing authorized (licensed) private institutions to conduct nominal (generally referring to small-scale) financial transactions with sanctioned entities for investigation purposes. The aim is to enhance the US government's tracking and law enforcement capabilities against sanctioned networks. The pilot period of this bill is five years. During the implementation period, licensed institutions must submit monthly transaction activity reports to OFAC, while OFAC is required to submit annual project operation briefings to relevant committees of both houses of Congress, including license issuance status, project effectiveness and improvement suggestions, as well as additional confidential briefings containing lists of licensed institutions, expenditure details, and other sensitive information. This bill emphasizes that this mechanism draws on the existing tools used by law enforcement agencies to monitor financial accounts in criminal investigations, aiming to fill the loopholes in investigation methods without weakening the existing sanctions effectiveness. This modernization initiative provides investigators with a key tool for tracking illegal financial networks, while not undermining the enforcement of sanctions, marking a shift in the US legislative sphere from the traditional "freeze-report" sanctions enforcement model to an "monitor, collect evidence, and targeted crackdown" proactive enforcement model.

The enforcement of U.S. export control often works in conjunction with the judiciary. At the judicial level, the liability for violations of export control for enterprises or individuals is divided into administrative liability, criminal liability and civil liability. For example, in administrative penalties, if one violates the EAR regulations, the individual may be fined up to 300,000 US dollars, or twice the value of the transaction, whichever is higher. There are also administrative liability consequences such as seizure and confiscation of goods, and restrictions on

export qualifications. Criminal liability imposes the maximum penalty of 1 million US dollars or a maximum of 20 years in prison, or a combination of both.

4.2. Characteristics of China's Export Control Laws

1) Overview of China's export control legal system

According to international law and international relations norms, no country should arbitrarily exercise jurisdiction and interfere in the affairs of other countries beyond its own territory. China bases its approach on this fundamental principle, and its export control legal system is mainly composed of four levels: laws, administrative regulations, departmental rules, and normative documents. At the legal level, the "Export Control Law of the People's Republic of China" (referred to as the "Export Control Law") is the core foundation; at the administrative regulations level, it mainly includes the "Regulations on the Export Control of Dual-Use Items of the People's Republic of China" (referred to as the "Control Regulations") and the "Regulations on Nuclear Export Control of the People's Republic of China", etc.; at the departmental rules and normative documents level, relevant supporting documents have been formulated by the Ministry of Commerce, the General Administration of Customs, and other departments. In addition, China has also assumed a series of international obligations by joining international organizations and signing international agreements, and these international rules have a significant impact on China's export control system.

In 2020 and 2021, the Ministry of Commerce successively issued departmental regulations, namely the "Regulations on the Unreliable Entity List" and the "Measures for Blocking the Improper Extraterritorial Application of Foreign Laws and Measures" (referred to as the "Blocking Measures"). The "Regulations on the Unreliable Entity List" and the "Blocking Measures" aim to prevent the improper influence of foreign laws and measures on Chinese enterprises and citizens, and to safeguard China's national security and interests. On November 15, 2024, the Ministry of Commerce, in conjunction with the Ministry of Industry and Information Technology, the General Administration of Customs, and the State Cryptography Administration, released the "Regulations on the Dual-Use Items Export Control List" (hereinafter referred to as the "Control List"), which was implemented simultaneously with the "Control Regulations". The Control List systematically integrates the scope of controlled items, uniformly assigns export control codes, and forms a complete list system. The Ministry of Commerce and the General Administration of Customs released the "2025 Annual List of Management for the Import and Export of Dual-Use Items and Technologies" (hereinafter referred to as the "Management List"). The items and technologies listed in the Management List refer to those subject to control or management in accordance with relevant laws, administrative regulations, and rules such as the "Export Control Law" and the "Cryptography Law". The list is divided into the "List of Management for the Import of Dual-Use Items and Technologies" and the "List of Management for the Export of Dual-Use Items and Technologies", and lists the

customs commodity codes corresponding to each category of dual-use items. The "Export Control Law" serves as the upper-level law, aiming to regulate China's export behavior, safeguard national security and interests, and stipulates in Article 44 that "foreign organizations and individuals outside the People's Republic of China who violate the relevant export control management provisions of this law, endanger the national security and interests of the People's Republic of China, and hinder the fulfillment of anti-proliferation and other international obligations, shall be dealt with in accordance with the law and held accountable for their legal responsibilities", setting for the first time an extraterritorial effect clause, stipulating that in certain circumstances, the Chinese government can control the relevant behaviors of foreign entities.

2) Scope of export control

According to the "Export Control Law" and the "Regulations on Export Control" and other regulations, the scope of China's export control mainly includes dual-use item export control, military product export management, nuclear export control, and export control of monitoring chemicals. At the same time, China also has separate technical export rules, mainly seen in the "Regulations on Technical Import and Export of the People's Republic of China" (referred to as the "Technical Import and Export Regulations") promulgated by the State Council and implemented on November 29, 2020. Dual-use items refer to items that have both civilian and military uses or have significant impacts on military uses, including but not limited to advanced computers, telecommunications equipment, navigation equipment, sensors, automation equipment, etc.

In October 2025, the Ministry of Commerce of China successively issued 7 announcements. Among them, 6 export control announcements respectively imposed export controls on strategic items such as super-hard materials, rare earth equipment and raw materials, medium and heavy rare earths, lithium batteries and artificial graphite anode materials, as well as foreign rare earth products and rare earth-related technologies containing Chinese components. One announcement included 14 foreign entities such as the anti-drone technology company (Dedrone by Axon), TechInsights (an advanced technology analysis and intellectual property service provider), and its branches in the "unreliable entity list". Among them, the 61st announcement set clear export license requirements for specific rare earths and their related items' overseas re-export activities, and established a hierarchical licensing approval policy based on different end-users and end-uses. It for the first time established clear "extraterritorial jurisdiction" requirements. China's export control has been upgraded, covering key industries such as new energy, advanced manufacturing, and strategic minerals, and the level of controlled items has significantly expanded. These series of measures mark that China's export control policies have achieved a transformation from traditional "item control" to "item - technology - data - entity" full-chain control. The policy focus has extended from preventing the outflow of sensitive resources to supply chain security and technological security domains.

3) Export control regulatory system

The Chinese export control regulatory system adopts a management system that combines unified management with division of responsibilities. It is based on laws such as the "Export Control Law", the "Anti-Foreign Sanctions Law", and the "Regulations on Unreliable Entity Lists", and has established a regulatory system covering "item control - technical restrictions - main body sanctions". On one hand, the national export control management department is responsible for the unified management and coordination of export control work; on the other hand, other relevant departments of the State Council are responsible for related work according to their respective duties. For example, the management of nuclear dual-use items exports is carried out jointly by the Ministry of Commerce and the National Atomic Energy Agency; for the export of biological dual-use items, the Ministry of Commerce, in accordance with the needs, cooperates with the Ministry of Agriculture and Rural Affairs, the National Health Commission and other departments for management.

China's export control measures mainly include license management, final user and final use management, and final user management, etc. Before exporting controlled items, exporters must apply for an export license from the Ministry of Commerce and provide detailed information on the final user and final use. The Ministry of Commerce decides whether to approve the export license based on factors such as the sensitivity of the exported items, the reliability of the final user, the legality of the final use, and the impact of the export on national security and interests. For high-risk exports, the Ministry of Commerce may require exporters to provide additional guarantees or take other risk management measures. In addition, China has established an export control list system, implementing list management for the export of certain specific items. When exporting items on the list, exporters must comply with the control measures stipulated in the list. China's export control regulatory agencies mainly include the Ministry of Commerce, the General Administration of Customs, the National Defense Science and Technology Industry Bureau, and the Equipment Development Department of the Central Military Commission. The Ministry of Commerce is responsible for the approval and management of export licenses, as well as the formulation and implementation of export control policies. The General Administration of Customs is responsible for the customs clearance supervision of exported items to ensure that the exported items comply with export control requirements. The National Defense Science and Technology Industry Bureau and the Equipment Development Department of the Central Military Commission are respectively responsible for the management and supervision of military product exports.

In recent years, China's export control policies have focused on the military sector and the rare earth supply chain. They have implemented strategic export controls on items ranging from super-hard materials to key raw materials for lithium batteries, and have simultaneously upgraded the measures of the list of unreliable entities.

4.3. Differences in Export Control Laws between China and the United States

1) Different control scopes

The scope of control not only includes items but also the controlled entities. One of the significant differences between China's export control and that of the United States at present is that China's export control is generally non-discriminatory and does not target specific countries. Therefore, China currently does not implement destination country grouping for export control as the United States does. Currently, the United States' export control is generally divided into four groups: A, B, D, and E. The four groups become increasingly strict in sequence. Under each group, based on different control purposes, there may be several lists. The five lists under the D group all include China. Additionally, in the multiple adjustments of the US export control rules in recent years, China has been listed as the main restricted object in the semiconductor field and other areas.

The fact that China's recent export control on rare earths does not target specific countries or regions does not mean that China completely ignores the risk identification of the export destinations. The destination is one of the factors considered by the Chinese authorities for approval. Article 8 of China's "Export Control Law" stipulates: "The national export control management department can assess the countries and regions where the controlled items are to be exported, determine the risk level, and take corresponding control measures." China's some export control measures in recent years have specific reasons and backgrounds, and are aimed at addressing specific international trade risks and even national security risks. After the Biden administration repeatedly introduced export control measures targeting China, on December 2024, the Ministry of Commerce of China issued Announcement No. 46 of 2024, "Announcement on Strengthening Export Control of Certain Dual-Use Items to the United States", stipulating: "1. Prohibit the export of dual-use items to military users or military purposes of the United States. 2. Generally, do not grant permission for gallium, germanium, antimony, and ultra-hard materials-related dual-use items to be exported to the United States; for graphite dual-use items to be exported to the United States, implement stricter final user and final use review." However, the relevant documents on rare earth export control issued by the Chinese government on April 4, 2025, and October 9, 2025, did not indicate targeting the United States. That is to say, as of now, for rare earth export applications with non-military users as the final users, there are no requirements of "generally not granting permission" and "implementing stricter final user and final use review". Moreover, from the current rules, applications related to civilian users of the United States that are not on the control list still have the right to apply for general licensing convenience. The Chinese government emphasizes that China's export control on rare earths does not target specific countries or regions, and does not explicitly label specific countries as so-called adversary countries. This precisely aims to leave room in handling China-US economic and trade relations.

2) Differences in the scope of extraterritorial effect

The scope of U.S. regulation and the regulated entities have a distinct extraterritorial nature. Through means such as territorial jurisdiction, control theory, and assistance liability theory, the jurisdiction is extended to foreign entities and actions. For instance, ECRA and IEEPA grant the U.S. government extensive powers, enabling it to impose sanctions and restrictions on foreign entities. These laws not only apply to U.S. citizens and enterprises but also to any foreign company or individual involved in U.S. technologies and products. The "50% rule" announced by BIS has significantly expanded the scope of its export control, having a considerable impact on a large number of Chinese enterprises. China has extraterritorial provisions, but it relies more on political and diplomatic background and case-by-case law enforcement. In response to a series of U.S. anti-sanctions export control measures, the Ministry of Commerce of China announced the 61st notice on October 2025, "Announcement on Implementing Export Control on Relevant Rare Earth Items from Abroad", which is a decision to implement export control on foreign-related rare earth items[5]. "Containing Chinese components, overseas rare earth items" are subject to export licensing management, and strict standards are set in terms of value ratio, end users and final uses. This is the first time that the Ministry of Commerce has carried out export control beyond domestic borders based on the approval of the State Council in accordance with Article 49 of the "Dual-Use Items Export Control Regulations". That is to say, the competent commercial department can "require" to implement extraterritorial jurisdiction within a certain scope. This is the policy of moderate extraterritorial jurisdiction in China's export control, and the implementation of extraterritorial jurisdiction over related rare earth items is the first exploration and practice of export control extraterritorial jurisdiction in China. This announcement also introduced a 50% penetration rule similar to the new regulations of the US on September 29th, and at the same time, in the 62nd announcement "Announcement on Implementing Export Control on Rare Earth-related Technologies", it is clearly stated that "providing Chinese rare earth-related technologies to overseas" also belongs to an export behavior, that is, "treated as an export", and a license must be obtained. This further expands the regulatory scope of export control[6].

The policy logics of both China and the United States present a mirror-like relationship in terms of form: both base their judgments on "original components" and achieve extended jurisdiction over the global supply chain through component traceability and value proportion rules. The difference lies in that the US focuses mainly on technology and software control, possibly aiming to restrict China's access to high-end chips and manufacturing equipment; while China focuses on rare earth resources and key technological processes, possibly aiming to prevent the abuse or reverse use of strategic raw materials and manufacturing capabilities in sensitive fields such as military. The interaction of this "component control"

[5]https://aqygzj.mofcom.gov.cn/qdml/art/2025/art_fbc5f7e23bff4bb184d5c49ff878f8ad.html.
[6]https://mm.mofcom.gov.cn/ddfg/art/2025/art_20cecf70844f46009b27969b6e8d14be.html.

model is causing new challenges for the global semiconductor and key material supply chain, such as double-layered bilateral licensing, complex supply chain compliance, and increased operational costs for multinational enterprises.

3) Enforcement measures for export control

The US export control enforcement measures are diverse and flexible, combining administrative, judicial and financial sanctions and other measures to form a strong deterrent force. In particular, the "long-arm jurisdiction" mechanism enables the US to effectively control enterprises and individuals worldwide. The BIS is responsible for maintaining the US's strategic technological leadership by implementing powerful export control measures and improving the treaty compliance guarantee system, thereby safeguarding US national security and facilitating the US in achieving its foreign policy and economic goals. Specifically, it is responsible for the revision and enforcement of CCL and ECCN arrangements, implementing specific export controls through EAR, and participating in the activities of the international four major multilateral export control mechanisms on behalf of the US. The BIS export control covers export, re-export, domestic transfer and deemed export behaviors, involving countries, industries, enterprises and individuals, and has a very wide scope. The BIS also undertakes the work of representing the US in participating in multilateral mechanisms such as the Wassenaar Arrangement and determining international control lists, reviewing annual exported items and approving foreign investment involving key technologies.

Based on the principle of "long-arm jurisdiction", the BIS has a very broad scope of control over "export activities" and the control over "exported items". Not only items produced in the United States or from the United States may be included in the control scope, but also items that rely on American technology for production or contain a certain proportion of "American components" may be included in the control scope, even if they are not produced by American enterprises. The BIS is not the only institution responsible for managing export activities, but it is the institution with the broadest management scope among the relevant authorities. Other export control authorities include: the Defense Trade Control Agency (DDTC) under the State Council, which mainly implements export control for some defense items; OFAC under the Department of the Treasury, which mainly implements export control through trade sanctions; the National Nuclear Security Administration (NNSA) and the Nuclear Regulatory Commission under the Department of Energy, which are mainly responsible for the export control of nuclear products. When the United States implements export control laws, it adopts various means to ensure their effectiveness. These include administrative means (such as license management, penalties), judicial means (such as civil lawsuits, criminal prosecutions), and financial sanctions (such as freezing assets, restricting transactions). At the same time, the US government also continuously improves and adjusts export control policies through methods such as information consultation, proposals from advisory committees, and congressional proposals, to enhance the adaptability and deterrent power of the laws.

China's export control enforcement measures are relatively concentrated, mainly relying on a combination of administrative measures and enterprise self-discipline. Although judicial measures are also being gradually improved, the overall deterrent effect is still not as strong as that of the United States. The "People's Republic of China Export Control Law" implemented in 2020 highly centralized the enforcement authority in the State Council's commerce department (i.e., the Ministry of Commerce), and coordinated with other relevant departments (such as the customs, the National Development and Reform Commission, the Ministry of Industry and Information Technology, etc.). The fourth chapter "Supervision and Management" and the fifth chapter "Legal Liability" of this law grant the competent authorities extensive administrative powers, including approval authority, supervision and inspection authority, administrative penalty authority, and list management authority. This "competent authority - approval - penalty" model essentially represents a pre-emptive and preventive regulatory model centered on administrative licensing. The logic lies in controlling risks through this "gate" of administrative approval rather than post-event accountability. This is fundamentally different from the "post-event, punitive" model centered on "enforcement - investigation - punishment" in the United States.

Article 14 of the "Export Control Law of the People's Republic of China" clearly requires export operators to establish an internal compliance system for export control. This is not a merely advisory clause but a legally binding obligation. The competent authorities can consider whether an enterprise has established and effectively operated a compliance system as a factor in determining whether it is granted export permission, or whether administrative penalties can be mitigated or waived. This actually "outsources" part of the regulatory responsibility to the enterprises themselves, forming a dual structure of "administrative supervision + self-supervision by enterprises". This model can improve regulatory efficiency under the condition of limited resources, but it also places higher requirements on the compliance capabilities of enterprises. The "Unreliable Entity List" serves as the core countermeasure tool and is currently the most powerful administrative measure in China. Its legal basis mainly comes from the "Regulations on the Unreliable Entity List", and it is highly administrative, comprehensive in punishment. Once included, it can simultaneously impose "restrictions or prohibitions on its engagement in import and export activities related to China", "restrictions or prohibitions on its new investments in China", "restrictions or prohibitions on the entry of its personnel", as well as new "prohibitions on the transmission of data or provision of sensitive information by organizations or individuals within China". The initiation of the list is often linked to specific political events, such as U.S. sanctions against China, and has a strong countermeasure orientation.

5. Analysis of China's Response Measures

The escalating export control measures implemented by the United States in recent years have evolved from a single trade tool into a core legal weapon serving its global strategy and aimed at curbing China's technological development. Re-

sponding to the US's export control measures involves a comprehensive and long-term game involving technology, law, economy, and diplomacy. China must go beyond the simplistic "countermeasures" mindset and build a three-dimensional response strategy based on internal innovation as the foundation, a legal system as the guarantee, and international cooperation as the bond.

5.1. Enhance Independent Research and Development Capabilities and Promote Breakthroughs in Key Technologies

The U.S. export control measures are directly targeting China's "critical choke-points", with the fundamental aim of slowing down China's progress in areas such as semiconductors, artificial intelligence, and high-end manufacturing. Therefore, enhancing independent research and development capabilities is the fundamental solution, and a legal guarantee system is the cornerstone for building a healthy innovation ecosystem. Through laws such as the "Industrial Policy Law" or the "Promotion Regulations for Strategic Emerging Industries", long-term support for key areas such as semiconductors, basic software, and industrial machines should be clearly defined. Establish a national technology security review system to conduct security assessments on mergers, joint ventures, and other behaviors involving key core technologies, to prevent technology leakage. At the same time, increase investment in basic research, establish national special funds, focus on cutting-edge fields such as semiconductors, AI, and quantum information, establish an "industry-university-research-application" integrated mechanism, accelerate the industrialization of laboratory technologies, encourage upstream and downstream enterprises, universities, and research institutions to jointly tackle challenges, and increase the domestic substitution efforts in areas with industrial chain risks. Improve the supporting regulations for the "Science and Technology Progress Law" and the "Promotion Law for the Transformation of Scientific and Technological Achievements", clearly define the distribution ratio of technology transfer income from state-owned research institutions, introduce the "no-fault exemption" clause, and reduce the legal risks for scientific researchers. At the same time, strengthen intellectual property protection, accelerate the revision of the "Patent Law Implementation Rules", establish "green channels" for rapid pre-examination, rapid confirmation, and rapid protection in the semiconductor and AI fields; explore the application of "fair, reasonable, and non-discriminatory" licensing in anti-monopoly reviews for foreign enterprises in China to prevent the abuse of standards from hindering independent innovation.

After being included in the "Entity List" by the United States, in September 2023, Huawei released the Mate 60 series of mobile phones equipped with a domestically produced 7nm 5G chip. Through the research and development of the "Harmony" operating system and the "Euler" server system, on January 2025, the Chinese enterprise DeepSeek broke through the US computing power blockade and reached the international leading level in natural language processing and multi-modal understanding. This indicates that Chinese enterprises have made

significant breakthroughs in chip technology, achieved independent breakthroughs in the software ecosystem, and proved the feasibility and necessity of independent innovation under extreme pressure. This also means that the technological blockade imposed by the United States on China's upstream industrial chain has, to a certain extent, forced these upstream enterprises to independently innovate, thereby achieving breakthroughs in the core technologies of key intermediate products. Through empirical research, under export control, the R&D investment of enterprises within the company has significantly decreased, and the increase in R&D investment mainly comes from government subsidies and the alleviation of financing constraints (Wang & Mei, 2025).

Establishing a national-level special fund is an important economic driver for promoting enterprises' independent innovation. Through policy incentives and increasing national investment, it ensures the long-term development of independent innovation, expands the scope of policy subsidies, promotes the popularization and application of key technological products in the industrial sector, precisely guides the efficient dynamic matching of technology and the market, and thereby promotes domestic substitution and accelerates the improvement of the national innovation system.

5.2. Improve the Legal Framework for Export Control and Enhance Export Control Measures

At present, China's export control list only includes about 900 items, and the overseas jurisdiction only covers related rare earth items; while the United States has over 3000 controlled items, and its overseas jurisdiction covers all areas[7]. During the process of responding to the US export control measures, China's export control system has been continuously improved, but it still needs further development to meet the increasingly complex international situation.

Appropriately expand the extraterritorial effect of China's export control measures. In the implementing regulations of the "Export Control Law", elaborate on the rules of "re-export" and "equivalent export", and clearly define the calculation method of "Chinese components"; incorporate "transit, transshipment, and transit transportation" into the jurisdiction, and make up for the shortcomings of "long-arm jurisdiction". One of the important roles of the 62nd announcement of the Ministry of Commerce of China in 2025 is to include the "equivalent export" behavior related to rare earth technologies under supervision, and this is also consistent with Article 2 of the "Export Control Law". Therefore, it is necessary to further strengthen coordination and alignment based on the implementation of technical import and export management in accordance with the "Technical Import and Export Management Regulations" and the export control work implemented in accordance

[7]Cui Fan, "Facts and Analysis of the Recent Dispute over Export Control between China and the United States", https://mp.weixin.qq.com/s/paavBEKxGzZHUEQz-EIT-Q?poc_token=HF1o-mijhap-JAdVSU1HY7Tq8UpMTG2aMcOpVzGPN.

with the "Export Control Law". Improve the dynamic adjustment mechanism of the list, establish a tripartite system of "national control list - commercial control list - final user and final use verification", and authorize the Ministry of Commerce to issue "rapid addition and reduction" announcements of controlled items every quarter to ensure precise control of strategic materials such as gallium, germanium, and rare earth permanent magnets.

Strengthen the connection between blocking and counter-sanctions, revise the "Measures for Blocking the Unilateral Extraterritorial Application of Foreign Laws and Measures", refine the application conditions, review timeframes, and relief channels for "prohibition orders", extend the "Freeze Assets" provision of Article 6 of the "Anti-Foreign Sanctions Law" to intellectual property licensing fees and equity dividends, and form a closed loop of property-based sanctions. Expand law enforcement methods and enhance deterrence. In terms of administrative measures, authorize the competent authorities to impose more severe penalties for violations, such as huge fines and revocation of long-term export qualifications; in judicial measures, promote the revision of the "Criminal Law", add charges related to violations of export control, hold criminal responsibility for acts of deliberately evading control and causing serious consequences, explore the establishment of a public interest litigation system, allowing the procuratorial organs to file lawsuits against export behaviors that endanger national science and technology security; in financial measures, authorize financial regulatory authorities to implement financial sanctions on transactions involving violations of export control, such as freezing accounts and restricting cross-border payments, and form synergy with administrative and judicial measures.

5.3. Strengthen International Cooperation and Restructure the Supply Chain

The "alliance containment" strategy of the United States aims to isolate China. China must deepen international cooperation and restructure global supply chains to break the blockade and build an alternative path of "de-Americanization". Further promote international industrial chain cooperation, optimize the layout of international supply chains, and accelerate the formation of an open and innovative ecosystem. In the short term, strengthening international industrial chain cooperation is conducive to reducing the risks faced by China's industrial and supply chains. It is possible to statistically analyze the total import volume and source countries of key core technologies, and identify the upstream technologies, components or equipment that are highly dependent on imports and are crucial to the national lifeline. For product fields with small technological gaps and those with large technological gaps and no import substitution possibilities from other countries, focus on taking independent innovation breakthroughs and accelerating the pace of domestic substitution. For product fields with large technological gaps and high import substitution possibilities, through strategies such as market opening and mutually beneficial technological cooperation, strengthen

industrial chain and supply chain cooperation with economies such as the European Union, ASEAN, and BRICS countries, establish a multi-level and multi-channel supply chain system, and enhance the autonomy and controllability of the industry. In addition, deepen international scientific research exchanges and cooperation, provide a more convenient mechanism for cross-border talent mobility, and increase the attractiveness of international top-level scientific and technological talents.

Although the United States attempts to build an anti-China supply chain system through alliances such as the "Mineral Security Partnership", its allies are not a monolithic block. For example, Canada prioritizes ensuring the lithium demand of its booming electric vehicle industry; Australian mining giants cannot easily abandon China, which is the world's largest market and customer. This "sleeping partner" situation has greatly reduced the actual effect of the "de-Chinaization" alliance. Through supply chain stress testing, identify China's allies, such as China's anti-restraints on rare earths. Skillfully avoiding direct confrontation, it adopted the supply chain stress testing method to open temporary rare earth export licenses to the three major car manufacturers—General Motors, Ford, and Stellantis—which not only alleviated the urgent needs of the car companies but also prevented the global electric vehicle industry from collapsing, and demonstrated its absolute control over the liquidity of rare earths. This is not only a direct response to the US technology control but also a strategic display: China also has a trump card that can grasp the "lifeblood" of Western high-tech.

In the revision of the "Foreign Trade Law", add a "supply chain security due diligence exemption clause". If enterprises can prove that they have fulfilled the obligation of "final user + final use" verification with upstream suppliers and retain the records for three years for reference, they can be exempted from joint liability caused by downstream violations. Encourage enterprises to return to rational and compliant rather than excessive compliance, and balance the business burden of Chinese enterprises. On the one hand, it is to maintain a certain interpretation space and application flexibility for legislators and law enforcement officers; on the other hand, it is also to avoid unnecessary losses for Chinese enterprises and put pressure on the United States and conduct dialogues.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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