

WTO Compliance of the "Guardrail Provisions" in the U.S. CHIPS and Science Act: Examining the Legal Boundaries of "Securitization" in Global Value Chain Restructuring

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Abstract. The U.S. CHIPS and Science Act of 2022 incorporates "guardrail provisions" that tie federal subsidies to recipients' pledges to limit semiconductor production capacity expansion in "countries of concern" for a decade, marking a new blend of industrial strategy and geopolitical restraint. This article analyzes the WTO compliance of these provisions by doing doctrinal analysis on SCM Agreement, GATT, and GATS. It claims that the guardrail provisions are de facto prohibited subsidies under Articles 3.1(a) and 3.1(b) of the SCM Agreement, which violates the Most-Favored-Nation obligation under GATT Article I by discriminating against specific Members without treaty authorization. Drawing from the Russia—Traffic in Transit (DS512) panel decision, the article further illustrates that the national security exception under GATT Article XXI does not offer unconditional justification for such actions. Set against the backdrop of the global trend toward "securitization" of value chains, this study adopts a Third World Approaches to International Law (TWAIL) framework to analyze how unilateral subsidies tied to security concerns diminish the policy space for development in emerging economies and reinforce unequal technological hierarchies. The article concludes by suggesting a dual-track strategy that integrates multilateral disciplinary reforms with plurilateral cooperation to preserve the openness of global semiconductor value chains.

Keywords: CHIPS and Science Act, guardrail provisions, WTO compliance, SCM Agreement

1. Introduction

In the current multipolar international environment, the global trade system is experiencing a significant transformation. While "decoupling" seems to have eased on the surface, in key strategic areas, China and the U.S. are still deeply decoupling. By using the rhetoric of "de-risking," the U.S. is moving towards a more covert "structural decoupling"—which is pushing for separation in key sectors, while keeping trade in non-critical sectors. In this process, the value chain has become a vital tool, since the West uses "securitization" and reorganization of these chains to achieve its strategic goals.

In August 2022, the U.S. government passed the CHIPS and Science Act of 2022. This legislation utilizes subsidies, tax incentives, and "guardrail provisions" to strengthen its domestic semiconductor sector, while simultaneously imposing restrictions on transactions and investments involving "countries of concern," notably China. The "guardrail provisions" are the core mechanism, effectively acting as a "conditional subsidy": firms that receive such subsidies are prohibited from engaging in significant transactions with countries of concern, especially in advanced semiconductors. This provision, which merges incentives with enforceable constraints on business practices, serves a crucial legal tool for the United States to spearhead the reorganization of the global semiconductor supply chain [1].

The "guardrail provisions" are a discriminatory barrier that excludes the countries from the exchange of subsidies for restrictions on investments and transactions. These provisions impose direct constraints on subsidized entities, and also indirectly influence business decisions via cost pressures, thereby incentivizing a reduction in commercial engagements with enterprises from "countries of concern." As a result, companies from these nations encounter higher barriers to entering the U.S. market, which severely weakens their competitive edge and creates a clear clash with the WTO's principles of non-discrimination and subsidy regulations.

This article's core argument is about two main questions: first, analyzing how the "guardrail provisions" don't meet the judicial scrutiny of GATT Article XXI from a legal standpoint. Second, it involves investigating whether the security exception clause is shifting from serving as a defensive safeguard to becoming a "golden key" for executing offensive restructuring of the value chain, and clarifying the legal limits for its appropriate use.

The research framework is structured in the following manner: Initially, it clarifies the legal classification of "guardrail provisions," examining whether they qualify as "prohibited subsidies" as outlined in the SCM Agreement. Next, it analyzes compliance according to the SCM Agreement and the GATT. The article proceeds to utilize the "three-step test" from the DS512 case to assess the validity of the U.S. invoking security exceptions. Finally, the article takes its perspective to the level of global value chains, pointing out the broader trend of major powers restructuring value chains under the pretext of "national security."

2. Literature review

Research concerning the "weaponization" of Global Value Chains (GVCs) is a prominent focal point in current academic discourse. Henry Farrell and Abraham L. Newman introduced the theory of "weaponized interdependence," positing that when network structures are asymmetrical and a specific state controls critical nodes, that state can exploit the "panopticon effect" and "chokepoint effect" to exert coercive influence over other nations [2]. The semiconductor industry, as a highly globalized value chain with significant power asymmetries, constitutes precisely such an asymmetrical network.

Scholars have presented varied viewpoints on the resilience of GVCs. Javorcik contends that GVCs are transitioning from an efficiency-centric approach to a security-focused one, yet true resilience must be rooted in the diversification of supply sources [3]. Antras, drawing from contract theory, highlights that GVCs derive their resilience from the inertia generated by prior sunk costs, yet firms will reassess partnership risks under new circumstances [4]. The academic community generally warns that if securitization measures serve as a pretext for protectionism, they will erode a country's long-term economic competitiveness.

Regarding the SCM Agreement, Zhuang Jianhui asserts that verifying an enterprise's receipt of a "benefit" remains a complex task [5]. Xie Lanxing points out that when subsidy benefits propagate

through global supply chains, their identification becomes increasingly ambiguous [6]. Additionally, the SCM Agreement primarily restricts the use of "specific" subsidies, yet modern industrial policies often adopt broad-based strategies, which can hinder the achievement of the required legal specificity.

Concerning GATT Article XXI, the DS512 case established a "three-step" review test: examining whether statutory objective circumstances exist, whether measures comply with good faith, and whether there is a "reasonable connection" between measures and security interests. Academic opinion remains divided: some U.S. scholars argue the "reasonable connection" standard constitutes judicial overreach, while scholars from the EU and developing countries are concerned the threshold is too low [7]. Currently, the "three-step" test remains ambiguous, and no clear consensus has been reached regarding the exact degree to which the "reasonable connection" must be met.

3. Research methodology

This study uses three methodological approaches. First, based on a close reading of the legal texts of the "guardrail provisions" in the CHIPS and Science Act, GATT 1994 (Articles I and III), the SCM Agreement (Articles I, II, III, and V), and GATT Article XXI, this study conducts analysis of all key core terms to interpret their conditions of application and practical legal effects.

Second, this paper analyzes key case law from the WTO Dispute Settlement Body: DS512 (Russia — Traffic in Transit) for the "three-step review" framework for GATT Article XXI; DS591 (Saudi Arabia — Intellectual Property) to supplementally verify the test; and DS547 (U.S. — Steel and Aluminium Products) to observe the panel's latest determinations on "emergency in international relations."

Thirdly, building upon substantive analysis of whether the "guardrail provisions" violate WTO rules, the article explores the systemic impact of this "securitization" trend on the multilateral trading system and offers recommendations for the future trajectory of the multilateral system.

4. Preliminary examination of the WTO compliance of "safeguard clauses"

4.1. The "guardrail provisions" constitute "conditional specific subsidies"

According to Article 1 of the SCM Agreement, two core conditions must be simultaneously satisfied for a subsidy to exist: (i) a financial contribution provided by a government or public body, and (ii) the recipient must thereby receive a benefit. Article 1.1(a)(1) lists four primary forms of financial contribution: direct transfers of funds, tax concessions, provision of goods or services other than general infrastructure, and entrustment of government functions to private entities.

The subsidies subject to the "Guardrail Provisions" originate from U.S. federal entities, comprising a total fiscal allocation of USD 52.7 billion and a 25% investment tax credit. Around 75% of the fiscal allocation is allocated as direct fund transfers to entities encompassed by the Act [8]. The remaining 25% is allocated as an investment tax credit, representing a tax concession provided by the government. Under the previous R&E tax credit system, businesses could claim credits for up to 20% of their qualified research expenses. Additionally, under the relevant capital investment regulations, companies were permitted to deduct 80% of equipment costs in 2023 and 60% in 2024 [6]. In contrast, the 25% tax credit introduced by the CHIPS Act surpasses the benefits previously available under these general tax provisions, constituting a financial contribution that involves the waiver of revenue otherwise owed. Recipients experience tangible advantages: extra funding eases financial burdens and greatly enhances strategic maneuverability, securing a clearly superior

competitive edge over those without subsidies. To preempt potential defense arguments by the United States based on broadened statutory interpretations, a further analysis from the perspective of De Facto Specificity is warranted. Article 2.1(c) of the SCM Agreement stipulates that even if legislation creates an appearance of a subsidy being "generally available", it may still constitute de facto specificity if in practical implementation the benefits are concentrated among a select few enterprises. Four specific elements must be satisfied to establish "Specificity": (a) the subsidy program is used by a limited number of certain enterprises; (b) predominant use is by certain enterprises; (c) disproportionately large amounts of subsidies are granted to certain enterprises; (d) the granting authority exercises discretion in its decision to grant the subsidy.

In practice, the subsidies are reviewed and disbursed by the U.S. Department of Commerce. The Department must assess the industry characteristics and investment behavior of the enterprises, and the process requires the execution of formal agreements, meaning the authority inevitably exercises its administrative discretion. Furthermore, coupled with the aforementioned statutory restrictions, only a minority of enterprises within the semiconductor industry can actually obtain the subsidies, and any remaining funds are not automatically distributed to unsubsidized entities. Therefore, the "Guardrail Provisions" also satisfy the requirements for De Facto Specificity.

4.2. Conflict with the agreement on subsidies and countervailing measures (SCM agreement)

The "Guardrail Provisions" qualify as actionable subsidies. Articles 5 to 7 of the SCM Agreement stipulate that specific subsidies, if they cause adverse consequences to other members' trade interests, may be challenged. Article 5 lists three forms of "adverse effects": injury to another member's domestic industry, nullification or impairment of benefits, and serious prejudice. The provisions restrict subsidized entities from engaging in significant transactions with "countries of concern" for ten years, requiring disclosure of capacity expansion transactions and full subsidy refunds for violations [9]. In order to avoid violating agreements with the Department of Commerce, subsidized entities will strive to circumvent transactions with enterprises in "countries of concern."

Furthermore, the provisions prohibit subsidized entities from participating in joint research or IP licensing with entities from "countries of concern" if such activities could potentially raise national security concerns—with interpretive authority resting solely with the U.S. government. The original exemption for "existing equipment" is rendered void when "significant renovation" activities are undertaken, though this term is not defined in the Act itself [10]. For example, South Korea's SK Hynix has indicated it may dismantle its semiconductor plant in China unless export restrictions are lifted. Alisa Liu of the Taiwan Institute of Economic Research projected that TSMC will likely slow investments in China and prioritize capacity building in the U.S., Japan, and Europe [10]. For example, South Korea's SK Hynix has indicated it may dismantle its semiconductor plant in China unless export restrictions are lifted. Alisa Liu of the Taiwan Institute of Economic Research projected that TSMC will likely slow investments in China and prioritize capacity building in the U.S., Japan, and Europe [10]. In summary, the subsidy conditionalities impose adverse effects on China's semiconductor industry, constituting actionable subsidies under the SCM Agreement.

For example, South Korea's SK Hynix has hinted that unless export restrictions on relevant equipment are lifted, it may dismantle its semiconductor plant in China. Alisa Liu, Senior Semiconductor Researcher at the Taiwan Institute of Economic Research, noted that, given ongoing U.S.-China tensions, "the likelihood of TSMC further expanding production in China is very low." She projected that "TSMC will likely slow down its investments in China and instead prioritize building capacity in the United States, Japan, and even Europe, while Taiwan will remain its core production hub".¹ Consequently, China's semiconductor industry is expected to witness a decline in

capacity investment. In summary, the subsidy conditionalities embedded in the "Guardrail Provisions" indeed impose adverse effects on China's semiconductor industry, thus constitute actionable subsidies under the SCM Agreement.

The "Guardrail Provisions" constitute prohibited subsidies as defined under the SCM Agreement. Articles 3 and 4 of the SCM Agreement stipulate that prohibited subsidies do not require proof of "adverse effects" and primarily encompass two core categories of prohibited subsidies: export subsidies (contingent, in law or in fact, upon export performance) and import substitution subsidies (contingent upon the use of domestic over imported goods). Because the "Guardrail Provisions" impose severe restrictions on significant transactions between subsidized entities and entities from "countries of concern", subsidized entities will prioritize engaging in transactions with entities from "non-countries of concern". Meanwhile, some subsidized domestic U.S. semiconductor companies will become more competitive in the market and are highly likely to become the preferred transaction partners for other domestic semiconductor enterprises. Therefore, the "Guardrail Provisions" will practically lead to domestic goods substituting imported goods. Furthermore, Section 103 of the CHIPS and Science Act of 2022 stipulates that priority should be given to ensuring manufacturing by eligible entities receiving subsidies. In other words, the subsidies provided by the CHIPS and Science Act of 2022 are essentially granted to those capable of filling gaps in technology or process nodes, thereby making import substitution a priority condition for eligible entities to obtain subsidies.² In summary, the "Guardrail Provisions" constitute an "import substitution" subsidy, and thus qualify as a "prohibited subsidy" under the SCM Agreement.

4.3. Conflict with GATT 1994

The "Guardrail Provisions" violate the Most-Favored-Nation (MFN) principle under Article I of the GATT, which requires that any advantage granted to any third country must be accorded immediately and unconditionally to all other WTO Members. The financial appropriations and tax reliefs under the CHIPS Act fall under the internal regulatory measures covered by GATT Articles III:2 and III:4. The provisions not only hinder semiconductor enterprises from "countries of concern" from investing in the U.S., but also allow semiconductor products from U.S.-friendly countries to capture the chip supply chain and gain superior competitive advantage. The EC — Bananas III (DS27) case established that even facially neutral regulation constitutes de facto discrimination if its implementation results in differential treatment. The Spain — Unroasted Coffee (L/5135) case established that products sharing identical physical characteristics, end-uses, and consumer-level attributes belong to "like products."

Furthermore, the "Guardrail Provisions" also violate the National Treatment (NT) principle under Article III of the GATT, which requires that once imported products enter a country's customs territory, they must be accorded treatment no less favorable than that accorded to like domestic products. U.S. domestic entities subsidized by the CHIPS Act inherently possess a competitive advantage. Coupled with the transaction restrictions imposed by the "Guardrail Provisions", even if Chinese semiconductor products manage to be imported into the United States, they will fall into a competitively disadvantaged position due to the compliance concerns and scrutiny costs of subsidized domestic entities. Their transaction opportunities will be significantly lower than those

¹Guardrails" on CHIPS Act Funding to Restrict Investments in China May Restrict Participation in CHIPS Act Incentives , Blog Post by Sujai Shivakumar, Charles Wessner, and Thomas Howell, Published November 7, 2023

²Guan Jian, "WTO Compliance Analysis of the CHIPS and Science Act of 2022," (China Forex, Issue 20, 2022).

of U.S. domestic products, their market space will be further compressed, and their treatment will be distinctly less favorable than that of like U.S. domestic products. It is worth noting that GATT Article III:8(b) provides for a "subsidy exception", stating that the mere "payment of subsidies exclusively to domestic producers" does not in itself violate national treatment. However, the WTO Appellate Body has strictly narrowed its application, requiring that three elements be met: the subsidy must involve the "payment of funds", it must be "exclusively paid to domestic producers", and it must not be funded from discriminatory internal taxes applied to imported products. Conversely, the subsidies under the "Guardrail Provisions" include tax reliefs (which constitute forgone government revenue rather than a direct payment of funds). Additionally, the recipients of the subsidies include not only semiconductor manufacturers but also related enterprises possessing testing, packaging, and other capabilities. The demands of such enterprises will cause the subsidies to interfere with market purchasing choices and induce the purchase of domestic products. Therefore, a U.S. defense invoking the "subsidy exception" cannot be established.

4.4. Failure of the preliminary WTO compliance test for the "guardrail provisions"

Based on the above analysis, the "Guardrail Provisions" not only violate the SCM Agreement by constituting actionable subsidies and prohibited subsidies, but they also violate the Most-Favored-Nation treatment principle and the National Treatment principle of the GATT. To justify its trade protection measures, the United States is highly likely to invoke the "security exceptions" clause under GATT Article XXI as a defense, in hopes of allowing its discriminatory measures to remain in effect.

5. Analysis of the applicability of the "security exceptions" under GATT article XXI

5.1. The three-step test for the "guardrail provisions"

In the DS512 case (Russia — Measures Concerning Traffic in Transit), the panel established a "three-step" review standard: (1) Review of Objective: examining whether the measure protects "essential security interests." (2) Objective Review of Facts: examining whether there exists a "war or other emergency in international relations"—this determination does not rely on self-assessment. (3) Plausibility Review: examining whether there is a plausible minimum connection between the measure and articulated security interests, and whether the measure is applied in good faith.

U.S. President Biden highlighted that the legislation would bolster both economic and national security. Senate Majority Leader Schumer acknowledged that the measure fulfills the goal of utilizing the CHIPS Act to outpace China [7]. The main purpose of these provisions is to counter China and mitigate potential "risks" to the U.S. semiconductor industry. Article XXI(b) specifies the necessary actions, such as those related to fissionable materials, traffic in arms and war implements, and those taken during war or emergency. Semiconductors exhibit a notable dual-use characteristic and find extensive application in military domains, potentially aligning with the criteria for category (ii). Given that the WTO acknowledges member states' discretion in defining "essential security interests," these provisions are likely to meet the necessary standards.

For the second step, U.S. national security concerns mainly come from the heavy reliance on TSMC for chip supply. Taiwan holds a dominant position in the global foundry sector, with a 63% share, and is a significant contributor to the high-end chips market, comprising 90% of sophisticated weapons systems [11]. Senator Todd Young emphasized the importance of the CHIPS Act in safeguarding national security and defense capabilities [7]. However, the absence of concrete

evidence indicates that the United States has yet to address the potential military actions against Taiwan. The DS512 case defines "emergency international relations" as armed conflict, potential armed conflict, or high-tension crises. The DS544 case made it clear that mere economic competition does not meet the criteria. The validity of the U.S. claim hinges on the panel's evaluation of U.S.-China relations.

Subjecting the "Guardrail Provisions" to a "minimum connection" analysis uncovers inherent flaws. First, although the provisions attract investment to the US, they also require subsidized companies to withdraw advanced production capacity from China and restrict transactions with China. Companies such as Intel and Micron will be barred from utilizing the Chinese market for localized operations, resulting in a loss of market share and revenue, as well as incurring substantial withdrawal expenses. This action diminishes the capacity of U.S. companies to reinvest their earnings, disrupts their advantageous relationships with the Chinese market and supply chains, and ultimately runs counter to the security objective of safeguarding domestic production capabilities. Second, regarding the protection of high-end technology, the United States could implement alternative strategies, such as enhancing intellectual property legislation. Instead, the "Guardrail Provisions" impose a one-size-fits-all ban without necessary review and ignore the actual needs of enterprises, lacking the minimum necessary connection to the goal of "preventing technology leakage". In summary the provisions struggle to pass the "minimum connection" test, they primarily serve the economic purposes of "industrial reshoring" and "economic decoupling", and are essentially a disguised form of trade restriction.

When examined under the "principle of good faith", the "Guardrail Provisions" hardly meet the requirements. Although the US claims its goal is to protect national security, the provisions deliberately incorporate "offensive" elements that exclude Chinese enterprises, going beyond the "defensive" measures of attracting corporate reshoring. Invoking the national security exception rules should fundamentally be based on the passive protection of a country's essential interests. However, the U.S. has clearly instrumentalized this rule. Its true intent is to seek legitimacy for containing China's development and maintaining its own technological superiority, bearing a pan-politicized undertone of "exchanging China's insecurity for domestic security". Therefore, it is difficult to conclude that this measure is taken in "true good faith" [12]. If the US genuinely wanted to protect its domestic semiconductor manufacturing capacity in "true good faith", it should absolutely not adopt discriminatory measures against "entities of concern", but should instead establish stable trade relations across multiple nodes to diversify risks. In conclusion, the "Guardrail Provisions" also cannot pass the scrutiny of the "principle of good faith".

5.2. The abuse and boundaries of the "security exception"

Based on the above analysis, even if the "Guardrail Provisions" may be subject to dispute in their determination of "essential security interests" and "emergencies in international relations", they possess fundamental flaws in two critical aspects: the "minimum connection" and the "principle of good faith". Therefore, as a whole, these provisions cannot pass the compliance test of the security exception clause, rendering the United States' claim invoking the national security exception untenable. This examination process also reveals a more alarming trend: national security exception clauses may be distorted and abused through the unilateral interpretation and defense by member states, gradually morphing into a political tool to "securitize" trade issues.

6. Conclusion

Through a legal analysis of the "Guardrail Provisions" in the U.S. CHIPS and Science Act, this article draws the following core conclusions:

First, the "Guardrail Provisions" constitute a subsidy that is de jure and de facto specific, conferring benefits such as direct funding and tax incentives while severely impairing the commercial opportunities and investment prospects of semiconductor industries in "countries of concern," producing significant import-substitution effects. These provisions prima facie violate the disciplines on actionable and prohibited subsidies under the SCM Agreement, and by discriminating against specific countries, breach the MFN and National Treatment principles of GATT 1994.

Second, according to the DS512 established three-step test, the "Guardrail Provisions" are not compliant. The provision does not have a "minimum connection" to the security objectives asserted, and its underlying purpose is clearly geopolitical: to restrict China's technological development and safeguard U.S. technological dominance. Such an approach does not meet the standard of good faith. Therefore, the clause is a disguised trade restriction that constitutes an abuse of the national security exception.

This study further reveals a profound systemic risk: amidst the context of GVC "securitization," the notion of "national security" has undergone a broad redefinition, leading to the increasing politicization of economic matters. The original clear legal boundaries of GATT Article XXI have become blurred, which puts the clause at risk of being used as a universal "key" for protectionist trade policies—thereby seriously undermining the rules-based multilateral trading system.

Affected parties may choose to pursue litigation through the WTO dispute settlement mechanism, while staying alert to the potential risk of an "appeal into the void." In the long run, multilateral system needs to do institutional reforms to clearly and strictly define the scope of security exception. Developing nations ought to take an active role in revising international regulations, while also adjusting their industrial strategies, bolstering independent research and development capacities, and improving the robustness of their supply chains.

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