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Modernising Digital Trade Rules: Addressing the Digital Governance Gap in WTO Rules

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Abstract. In the context of the deep integration of the global digital economy, digital trade has become the core engine of international trade growth. However, the current rule system of the World Trade Organisation (WTO) is ill-equipped to address the challenges posed by new trade forms such as artificial intelligence and cross-border data flows, with the digital governance divide becoming increasingly evident. This paper takes 'modernisation of digital trade rules' as its core theme, employing case law analysis to systematically examine the institutional shortcomings of WTO rules in the field of digital trade and propose targeted improvement pathways. The study identifies three core issues with the current rules: first, the absence of a dedicated digital trade agreement has resulted in institutional gaps; second, rule provisions lag behind the development of emerging technologies; and third, the abuse of security exception clauses has created enforcement challenges. Based on an analysis of typical WTO cases, this paper proposes reforms in three areas: improving existing rules, establishing a dedicated digital trade mechanism, and innovating dispute resolution methods. These reforms aim to achieve a balance between data free flow and security regulation, thereby safeguarding the development rights of developing countries in digital trade.

Keywords: digital trade, WTO rules, governance gap, rule modernisation, case analysis

1. Introduction

Since the start of the 21st century, the rapid advancement of digital technology has transformed global trade, with emerging forms like artificial intelligence, cloud computing, and cross-border data flows becoming key economic growth drivers. However, the WTO's trade governance framework remains centred on the 1995 General Agreement on Trade in Services (GATS), which was designed for traditional goods and services trade and struggles to address digital trade's technical features and governance needs. The tension between "rule lag" and "digital trade development" has grown increasingly acute.

Recent global digital trade disputes have exposed a "digital governance gap" in WTO rules: they fail to clearly define the legal attributes of new trade elements such as data and algorithms, cannot balance data security with trade liberalisation, and struggle to curb digital protectionism disguised as "national security" measures. This paper focuses on 'modernising digital trade rules,' analysing the specific shortcomings of current WTO rules, their manifestations in real cases, and potential pathways for improvement. It aims to enrich research on multilateral trade system reform, provide

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references for WTO member states in rule negotiations, support developing countries in rule formulation, and contribute to building a fairer and more efficient global digital trade governance system.

2. Analysis of the shortcomings of WTO digital trade rules

2.1. Institutional shortcomings: the lack of a dedicated digital trade agreement

The DS612 case (Brazil v. United States Digital Services Tax Discrimination) highlights institutional flaws in WTO digital trade governance. The U.S. applied different tax rates to foreign and domestic digital service providers, prompting Brazil to argue that this violated GATT Article 1's Most-Favoured-Nation (MFN) principle. However, without unified WTO rules on digital services taxes, the panel issued only a vague ruling citing GATT's "national treatment" principle, calling the U.S. measures "unreasonable discrimination" but failing to clarify core issues like tax standards or base definitions. The dispute ended in a temporary compromise.

This case reveals the absence of a dedicated digital trade agreement in the WTO framework. Currently, digital services trade is primarily regulated by GATS, a 1990s-era agreement focused on traditional service models like "cross-border supply" and "consumption abroad," with no explicit definition of "digital services." GATS Article 1's definition of "services" excludes intangible digital products such as AI models and algorithms, nor does it clarify whether cross-border data flows qualify as "cross-border supply" [1]. This ambiguity leads to significant differences among member states in how they characterise digital trade. In short, the lack of a dedicated agreement causes unclear rule application and regional fragmentation, weakening the WTO's central role in digital trade governance.

2.2. Lagging provisions: disconnect from emerging technological developments

The DS608 case (EU v. India Cross-Border Data Flow Restrictions) illustrates the mismatch between WTO rules and technological progress. India's 2022 Personal Data Protection Act required "core personal data to be stored locally," which the EU claimed violated GATS Articles 2 and 16. India defended its policy by invoking GATS Article 14's'security exception,' asserting that data localisation was 'necessary to protect citizens' privacy.' The key dispute was whether data privacy constitutes a "fundamental security interest." Since GATS Article 14 does not explicitly include data security or personal privacy in "fundamental security interests," the panel issued a compromise ruling that avoided the core legal issue.

This case exposes the outdated nature of WTO provisions. Core rules like GATS and TRIPS were created before digital technology's rise and cannot address new trade forms driven by AI and big data. In cross-border data flows, GATS Article 14's ambiguity leads to divergent interpretations among member states. Clearly, lagging provisions leave WTO rules ineffective in tackling issues like data privacy protection and AI data ownership, severely undermining their regulatory impact on digital trade.

2.3. Enforcement challenges: abuse of the security exception clause

The DS615 case (China v. United States Semiconductor Export Controls) highlights enforcement difficulties in WTO rules. The U.S. imposed export restrictions on AI chips with over 100 TOPS computing power to China but exempted allies like Canada and Japan. China argued this violated GATT Articles 1 and 11, while the U.S. invoked GATT Article 21's "security exception," claiming

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restrictions were "necessary to protect defence supply chain security." However, the U.S. provided no direct evidence that the chips were used for military purposes, relying instead on "potential risks" to justify exemptions. Since GATT Article 21 does not specify proof standards for "national security," the panel could not rule the U.S. measures unlawful, prolonging the dispute.

This case underscores how vague definitions allow security exception clauses to be abused as tools of digital protectionism. GATT Article 21 and GATS Article 14 lack clear definitions of the scope of 'national security' [2] or the burden of proof, enabling some developed countries to include 'industrial competition' within the scope of 'national security' without objective risk assessments.

3. Directions for improving WTO digital trade rules

3.1. Improve the existing rules system and fill institutional and regulatory gaps

3.1.1. Promote the digital upgrade of the GATS framework

Upgrading GATS is foundational to bridging the digital governance gap, as it remains the core agreement regulating services trade.

Firstly, clarify digital trade's legal status and scope. Add a "Digital Services Annex" to GATS, defining "digital services" as "services provided via information and communication technology (ICT)"—covering cloud computing, AI services, and digital content—and explicitly classifying them under "cross-border supply" (Mode 1), subject to GATS' market access and non-discrimination principles. The annex should define data as a "core element of digital services," with cross-border flows generally free from barriers except for exceptions involving national security or sensitive personal information [3].

Secondly, introduce a "negative list" [4] management model to expand digital services market access. Drawing on CPTPP Chapter 14 rules, require member states to publicly disclose digital services restrictions via a "negative list"; unlisted areas automatically qualify for MFN and national treatment. The list should clearly specify retained restrictions. To balance interests, a 'developing country special list' should be established to allow more protective measures, with commitments to gradually reduce restrictions—e.g., being updated every three years and undergoing regular WTO reviews.

3.1.2. Refine security exception clauses to curb rule abuse

Abuse of security exceptions is a primary tool for digital protectionism. Refining these clauses requires addressing scope definition, burden of proof, and review mechanisms:

First, clarify "fundamental security interests" scope and boundaries. Revise GATT Article 21 and GATS Article 14 (Article XIV bis) to require member states to link measures to identified security threats (e.g., military use or critical infrastructure risks) and prohibit the inclusion of 'industrial competitive advantages' or 'economic security' in exceptions [5].

Second, establish strict proof and review standards. Member states invoking security exceptions [6] must submit 'triple evidence': (1) a third-party 'Security Threat Assessment Report' proving the 'authenticity' and 'urgency' of the threat (e.g., a >70% probability of occurrence within 90 days); (2) "causal relationship proof" linking measures to threats (e.g., technical analysis of data breach pathways to critical infrastructure failure); (3) an alternative options assessment demonstrating measures are the "least trade-restrictive" choice. Evidence must undergo review by a WTO technical

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expert panel (combining technical and legal experts) within a reasonable timeframe, with results guiding dispute resolution.

Third, introduce a blockchain-based evidence storage and disclosure mechanism to enhance transparency. Member states must upload security exception-related evidence (threat assessments, measure texts, alternative analyses) to a WTO blockchain platform for integrity and traceability. The platform should classify disclosures: non-confidential information accessible to all members, confidential information limited to technical experts. This prevents evidence forgery and reduces reliance on "subjective claims" for exceptions.

3.2. Establish a digital trade committee to strengthen institutional mechanisms

The WTO's current structure lacks a dedicated body for digital trade, thereby hampering the efficiency of rule coordination and dispute resolution. A permanent "Digital Trade Committee" [7] is proposed to drive rule modernisation.

3.2.1. Composition and core functions of the committee

The committee would include representatives from all WTO members, with roles for a chairperson, technical expert group, and secretariat. Its core functions are:

First, rule coordination and standard-setting. Regularly organise digital trade rule negotiations to conclude a "Multilateral Agreement on Digital Trade" covering cross-border data flows, digital services taxes, and AI governance. Coordinate national digital standards and establish a "cross-border data flow white list": countries meeting "data security standards" enjoy simplified flow reviews; others negotiate bilateral mutual recognition agreements. This reduces regional rule fragmentation and business compliance costs.

Second, technical assistance and capacity building. Provide "customised" support for developing countries: annual digital trade rule training (covering GATS Digital Annex and security exceptions), local talent cultivation, and a "South-South cooperation" platform for sharing digital governance experiences.

Third, dispute prevention and early warning. Build a global digital trade policy monitoring database to track real-time measures (data localisation, digital taxes) and publish regular reports highlighting potential frictions. For high-risk measures, the committee initiates "preventive consultations" to facilitate dialogue and avoid dispute escalation—e.g., early detection of U.S. digital services tax discrimination in DS612 could have prevented formal disputes [8].

3.2.2. Innovating digital trade dispute resolution mechanisms

Traditional WTO dispute mechanisms suffer from delays and insufficient technical expertise, ill-suited to digital trade's unique nature. Proposed innovations include:

First, establish a digital trade arbitration tribunal [9]. Experts with legal and technical backgrounds should be selected to form an arbitration team, which would adopt streamlined procedures. Simplify evidence presentation and introduce a "technical expert witness" system, where experts testify on AI principles or data flows to help arbitrators grasp dispute cores.

Second, build a metaverse dispute resolution scenario [10]. Use 3D modelling to recreate disputes (e.g., DS608 data flow paths or DS615 chip technology), enabling intuitive technical understanding. Via VR, disputing parties demonstrate measure effects in virtual scenarios to improve factual

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determination accuracy. This technology-driven approach reduces technical dispute adjudication complexity.

Third, advance negotiations on the Multilateral Agreement on Digital Trade for unified rules [11]. Unify digital services tax standards—defining the tax base as "revenue from local digital service users" and prohibiting discriminatory foreign provider rates. Clarify digital platform anti-monopoly obligations: prohibit "data hoarding" and "algorithm collusion," and bar market advantage abuse to exclude competition.

4. Conclusion

This paper analyses cases such as DS615, DS608, and DS612 to reveal the three core deficiencies of WTO digital trade rules: institutional gaps leading to rule fragmentation; outdated provisions that fail to keep pace with technological changes; and the abuse of security exceptions, coupled with the lack of voice for developing countries, which together create implementation challenges. These deficiencies collectively form a digital governance divide, which hinders the healthy development of global digital trade.

To address these issues, this paper proposes a systematic improvement pathway: at the rule level, promote the digital upgrade of the GATS, refine security exception clauses, and improve digital intellectual property rules; at the mechanism level, establish a Digital Trade Committee and strengthen technical assistance and dispute resolution capabilities; at the multilateral level, advance negotiations on the Multilateral Agreement on Digital Trade to achieve rule harmonisation. These pathways are grounded in the feasibility of the current WTO framework, while also taking into account the technical characteristics of digital trade and the interests of developing countries, thus forming a progressive reform plan of 'short-term fixes - mid-term mechanisms - long-term agreements.'

The study's limitations include insufficient cost-benefit analysis of rule reforms, a lack of quantitative assessment of the economic impacts of measures on different countries, and insufficiently in-depth discussions on coordination pathways between regional and multilateral rules. Future research could be expanded in two directions: first, constructing a 'general equilibrium model for digital trade rule reforms' to simulate the impacts of different reform schemes on global trade flows and industrial structures; second, comparing the similarities and differences between regional rules such as the CPTPP and RCEP to identify core provisions that could be incorporated into multilateral agreements.

Against the backdrop of the digital economy profoundly reshaping the global trade landscape, the modernisation of WTO rules is now urgent. Only through collaborative efforts to build a fair and inclusive digital trade rules system can the governance gap be bridged, enabling the digital economy to truly become a 'universal engine' driving global economic growth.

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