

Aligning with High-Standard International Rules: Institutional Openness in Digital Services Trade Agreements

-- Evidence from a Textual Analysis of RTAs, 2000–2024

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Abstract

Against the backdrop of the global digital trade rule system restructuring, where Regional Trade Agreements (RTAs) have become the core vehicle for digital rules, this paper focuses on the core issue of institutional opening in digital service trade to align with high-standard international rules. Based on a text quantification methodology, the study selects RTAs containing digital service trade clauses that were signed and entered into force between 2000 and 2024 as samples. It constructs heterogeneity indicators for these clauses and combines data visualization techniques such as box plots and heat maps with empirical analysis to examine the influencing factors of the signing of digital service trade clauses and their quality. The research finds that geographical distance, economic scale, the digital divide, and differences in institutional environments significantly affect the signing of RTAs and the quality of their clauses. This study provides empirical support and policy recommendations for China to precisely align with high-standard international digital service trade rules and advance institutional opening.

Keywords

Digital Service Trade; Regional Trade Agreements; CPTPP; Institutional Opening.

1. Introduction

Digital services trade has become a core engine of global economic growth, while regional trade agreements (RTAs) are increasingly replacing multilateral mechanisms as the primary carriers of digital trade rules. Under the World Trade Organization framework, the regulation of digital services trade exhibits clear limitations. In contrast, digital trade rules embedded in RTAs have expanded rapidly and evolved into three representative templates. The US-style approach, exemplified by United States–Mexico–Canada Agreement, emphasizes the free flow of cross-border data and the protection of source code. The EU-style approach, represented by the EU–UK Trade and Cooperation Agreement, prioritizes privacy protection and data sovereignty. The China-oriented approach, reflected in Regional Comprehensive Economic Partnership, adopts a principle of prudent and gradual openness. Against the backdrop of increasing fragmentation in global trade rules, how to secure strategic initiative in digital trade governance has become a critical issue for upgrading digital services trade.

Recent data further indicate that China's digital services trade exports have entered a phase of rapid growth. In the first half of 2025, the total volume of cross-border e-commerce imports and exports reached RMB 1.32 trillion, representing a year-on-year increase of 5.7%, significantly outpacing the global average. However, the development of digital services exports continues to face multiple institutional constraints. First, there is a lack of alignment with

international rules. Only about 40% of China's existing RTAs include provisions on cross-border data flows, and notable gaps remain relative to high-standard agreements such as Comprehensive and Progressive Agreement for Trans-Pacific Partnership and Digital Economy Partnership Agreement. Second, regulatory coordination remains insufficient. According to the Organisation for Economic Co-operation and Development Digital Services Trade Restrictiveness Index, China imposes relatively higher restrictions than the international average in areas such as data localization and cross-border data transfer approvals. Third, regional disparities are pronounced. In 2024, Shanghai accounted for 30.1% of China's total digital trade imports and exports, while the facilitating role of digital infrastructure in central and western regions remains limited. These bottlenecks hinder the transformation of China's scale advantage in digital services trade into rule-making influence.

Promoting institutional openness, aligning with high-standard international rules, and fostering high-quality development of digital services trade have therefore become key concerns for both policymakers and scholars. The first strand of literature relevant to this study focuses on institutional openness. Existing studies mainly examine its measurement and economic effects. In terms of measurement, scholars have developed approaches based on the alignment with international economic and trade rules, including coordination of technical standards (Li and Lang, 2025), as well as text-based methods that construct institutional openness indicators using keyword analysis (Zhuo and Mao, 2023)[12]. Regarding economic effects, numerous studies exploit quasi-natural experiments based on policy initiatives such as the establishment of free trade pilot zones (Xiao et al., 2025)[6], the negative list system for market access (Zhu and Wang, 2025)[11], and cross-border e-commerce pilot zones (Li, 2024). These studies examine outcomes such as urban green development (Yao and Peng, 2024)[7], industrial chain resilience (Zhao et al., 2024)[9], firm digital transformation (Zhao and Fang, 2025), and firms' outward investment (Xie, 2025), providing empirical support for the importance of institutional openness.[10]

The second strand of literature concerns high-standard international trade rules. Existing research has extensively analyzed the content and structure of such rules and provided policy implications for alignment. For instance, Pan (2025), Ying (2025), and Dong and Guo (2025) examine key provisions of the CPTPP from different perspectives[4], while Zhang and Lu (2025), Huo (2024), and Chen and Hu (2025) analyze digital trade provisions under the DEPA framework.[5][8] However, most of these studies adopt a forward-looking approach, using textual analysis to evaluate the multidimensional impacts of high-standard rules on participating countries. Few studies combine text-based analysis with econometric methods to investigate, in a reverse analytical framework, the determinants of aligning with high-standard international rules.

This study contributes to the literature by systematically identifying the determinants of signing digital services trade provisions in RTAs and developing an integrated analytical framework linking institutional environments to levels of institutional openness.

The remainder of this paper is structured as follows. Section 2 presents conceptual definitions and theoretical analysis. Section 3 outlines the research design and empirical results, focusing on the determinants of adopting digital services trade provisions in RTAs. Section 4 concludes with policy implications.

2. Conceptual Framework and Theoretical Analysis

(1) Conceptual Definitions

1) Digital services trade

Digital services trade is a core component of digital trade, referring to cross-border service transactions delivered through digital technologies such as the internet and cloud computing

to meet production or consumption needs. Its defining criterion is digital delivery, meaning that the entire process of production, transmission, and consumption is conducted via digital networks without reliance on physical carriers. Distinct from digitally enabled traditional services, the World Trade Organization (2024) defines digital services trade as services fully produced, transmitted, and consumed through information and communication technologies, enabling cross-border delivery without physical intermediaries. This definition highlights three key features: digitalized inputs, dematerialized processes, and virtualized value networks.

2) High-standard international rules

The Comprehensive and Progressive Agreement for Trans-Pacific Partnership is widely regarded as the benchmark for high-standard digital trade rules. First, it demonstrates strong regulatory leadership. Unlike Regional Comprehensive Economic Partnership, which allows exemptions for data localization on security grounds, CPTPP explicitly restricts unnecessary data localization requirements and provides enforceable dispute settlement mechanisms. Second, CPTPP aligns closely with China's policy objective of advancing institutional openness and building a digital trade power. Third, it has broad regional influence, covering major trading partners such as Japan, Canada, and Australia, and exhibits a significant rule diffusion effect across global digital markets.

(2) Theoretical Analysis

Divergences in digital services trade rules extend beyond economic considerations to include differences in culture, values, political systems, and legal frameworks, making short-term convergence difficult. The formation of trade agreements is primarily driven by potential net welfare gains, which depend on the relative magnitude of trade creation and trade diversion effects. Accordingly, factors influencing trade flows also shape the likelihood of agreement formation.

Building on Scott L. Baier and Jeffrey H. Bergstrand (2004)[3], as well as Gianluca Orefice and Nuno Rocha (2014)[2], this study proposes the following hypotheses[1]:

Hypothesis 1: Countries with larger and more similar economic sizes, and shorter geographical distance, are more likely to sign digital services trade agreements, as greater potential for trade creation increases the expected benefits of rule negotiation.

Hypothesis 2: Greater institutional differences between countries increase negotiation costs and reduce net welfare gains, thereby lowering the likelihood of signing digital services trade provisions.

3. Research Design and Empirical Analysis

(1) Research Design

1) Sample selection and data sources

Given that the first RTA containing digital services trade provisions-the US-Jordan FTA-was signed in 2000 and entered into force in 2001, this study uses RTAs signed between 2000 and 2024 and effective between 2003 and 2025 as the empirical sample. Among them, 116 agreements include digital services provisions. As some agreements are not available in English, the final sample consists of 94 English-language RTAs for detailed analysis.

Textual data on trade agreements are obtained from the World Trade Organization database, which comprehensively records global RTAs. Data on GDP, GDP per capita, internet penetration, and high-income country classification are sourced from the World Bank. Traditional control variables, such as geographic distance, are drawn from the CEPII database. Political risk indicators are obtained from the International Country Risk Guide, comprising 12 sub-indicators, with lower scores indicating higher risk.

The Digital Services Trade Restrictiveness Index (Digital STRI), provided by the Organisation for Economic Co-operation and Development, is used to measure regulatory barriers in digital services trade. The index ranges from 0 (fully open) to 1 (highly restrictive) and covers five dimensions: (i) infrastructure and connectivity, (ii) electronic transactions, (iii) payment systems, (iv) intellectual property, and (v) other barriers (e.g., digital service taxes and content restrictions). Bilateral digital trade data at the sectoral level are obtained from the UN Comtrade.

2) Construction of heterogeneity indicators for digital services provisions

① Scope of digital services provisions in RTAs

This indicator captures the extent of attention given to digital services trade provisions within RTAs. Following Elsig and Klotz (2018), who examine treaty design features to characterize variation across agreements, this study constructs two measures of scope. The first measure (Scope1) is the number of digital services-related provisions included in an RTA. The second measure (Scope2) is the frequency of keywords associated with digital services provisions within the agreement text. Higher values of these indicators imply broader regulatory coverage and greater heterogeneity in digital services provisions.

Table 1. Keywords used for constructing Scope2 (partial list).

Category	Original Term	Standard Translation (Digital Services Trade Context)
Technical infrastructure	telecommunications	Telecommunications services
	computer	Computer services
	information	Information services
	technical	Technical consulting services
Financial and insurance	insurance	Insurance services
	financial	Financial services
Education and marketing	education	Education services
	marketing	Marketing services
R&D and engineering	R&D	Research and development services
	engineering	Engineering services

② Textual similarity between digital services provisions in RTAs and those in the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (Similarity)

This study adopts the CPTPP as the benchmark because it represents one of the most comprehensive and high-standard frameworks for trade and investment rules currently established by developed economies. While CPTPP members are directly bound by these rules, increasing trade openness and digital services liberalization are expected to drive other RTAs toward gradual convergence with CPTPP standards.

The similarity indicator captures the extent to which digital services provisions in a given RTA resemble those in the CPTPP. A higher value of Similarity indicates greater textual alignment, reflecting deeper regulatory commitments and thus capturing heterogeneity in the depth of digital services provisions across RTAs.

To operationalize this measure, textual similarity is employed as a simple yet effective method for processing agreement texts. Specifically, clause-level keyword-based term-weight vectors are constructed. For each agreement *iii*, the weighted vector of digital services-related terms is

denoted as $W_i = (w_{i1}, \dots, w_{iK})^T$, while the corresponding vector for the CPTPP is denoted as $W^* = (w_1^*, \dots, w_K^*)^T$. The similarity index is then defined using cosine similarity as follows:

$$\text{similarity}_i = \frac{w_i^T w^*}{\|w_i\|_2 \|w^*\|_2} = \frac{\sum_{k=1}^K w_{ik} w_k^*}{\sqrt{\sum_{k=1}^K w_{ik}^2} \sqrt{\sum_{k=1}^K (w_k^*)^2}} \in [0, 1] \quad (1)$$

A Similarity value closer to 1 indicates that the term-weight distribution of agreement iii is more consistent with that of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership. In addition, Scope1 is defined as the number of digital services-related provisions included in an agreement, while Scope2 measures the number of distinct keywords associated with digital services coverage.

To construct a composite indicator of heterogeneity in digital services provisions, this study applies principal component analysis (PCA) to the three indicators described above. The resulting index (Pca) captures both the breadth and depth of digital services provisions and can be directly used for cross-agreement comparisons. A higher value of Pca indicates broader coverage and deeper regulatory commitments in digital services trade.

Table 2 reports the correlation coefficients among these indicators. The results show that the coefficients range from 0.71 to 0.98 and are statistically significant, suggesting that these measures share common underlying components.

Table 2. Correlation matrix of digital services trade provision heterogeneity indices.

	Pca	Scope1	Scope2	Similarity
Pca	1			
Scope1	0.9797***	1		
Scope2	0.9156***	0.8732***	1	
Similarity	0.9191***	0.8815***	0.7059***	1

*Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. The same notation applies to all subsequent tables.

4. Variable Description

4.1. Dependent Variables

In Model 1, the dependent variable is D_{ij} , where subscripts i and j denote the two trading partners. D_{ij} is a binary variable indicating whether a digital services trade provision is included in the bilateral RTA, taking the value of 1 if such provisions exist and 0 otherwise.

In Model 2, the dependent variable is $Index_{ij}$, which captures the quality and heterogeneity of digital services provisions. It is measured using four indicators-Scope1, Scope2, Similarity, and Pca. Higher values indicate broader coverage and greater depth of digital services trade provisions within the RTA.

4.2. Explanatory Variables

Table 3. presents the definitions and descriptions of the explanatory variables.

	Variable symbol	Variable name	Variable meaning
I. Geographic factors	$Dist_{ij}$	Bilateral geographic distance	The geographic distance between the two trading partners
	$Remote_{ij}$	Relative external distance	The distance of each country from the rest of the world excluding its trading partner
II. Economic factors	$sumgdp_{ij}$	Sum of bilateral GDP	The combined GDP of the two trading partners
	$simgdp_{ij}$	Economic similarity	The product of each country's share in the sum of bilateral GDP
	$Rgdppc_{ij}$	Relative GDP per capita	The logarithm of the ratio of the higher to the lower GDP per capita between the two partners
	$sqRgdppc_{ij}$	Squared term of relative GDP per capita	The squared term of relative GDP per capita
III. Country-pair type	NN_{ij}	"North–North country-pair dummy"	Equals 1 if both trading partners are high-income countries, and 0 otherwise
	NS_{ij}	"North–South country-pair dummy"	Equals 1 if one trading partner is a high-income country and the other is not, and 0 otherwise
IV. Internet infrastructure and institutional factors	$Rnet_{ij}$	Relative internet penetration	Equals 1 if one trading partner is a high-income country and the other is not, and 0 otherwise
	$Ricrg_{ij}$	Relative political risk	The relative difference in domestic political stability between the two trading partners
	$Rdtri_{ij}$	Difference in digital services trade restrictiveness	The absolute difference in the Digital Services Trade Restrictiveness Index between the two trading partners

(1) Model Specification

This study constructs the following econometric models for empirical analysis:

$$D_{ij} = \alpha_0 + \alpha_1 Dist_{ij} + \alpha_2 Remote_{ij} + \alpha_3 Sumgdp_{ij} + \alpha_4 Simgdp_{ij} + \alpha_5 Rgdppc_{ij} + \alpha_6 SqRgdppc_{ij} + \alpha_7 NN_{ij} + \alpha_8 NS_{ij} + \alpha_9 Rnet_{ij} + \alpha_{10} Ricrg_{ij} + \alpha_{11} Rdtri_{ij} + \varepsilon_{ij}$$

The model is designed to examine the determinants of the likelihood that two countries sign an RTA containing digital services trade provisions. The dependent variable D_{ij} is a binary indicator capturing the decision to sign such provisions.

The explanatory variables cover four key dimensions: geography, economic factors, country-pair types, and digital infrastructure and institutions, thereby integrating traditional determinants of trade agreements with the specific characteristics of digital services trade.

Specifically, $Dist_{ij}$ denotes bilateral geographic distance. Greater distance increases not only transportation costs but also institutional and cultural differences, thus acting as a barrier even for digitally delivered services; therefore, α_1 is expected to be negative. $Remote_{ij}$ following Baier and Bergstrand (2004)[3], measures the average distance of each country to the rest of

the world (excluding its partner)[1]. Greater remoteness implies stronger bilateral trade dependence, increasing the likelihood of agreement formation; hence, $\alpha_2 > 0$. Economic size is proxied by GDP. $Sumgdp_{ij}$ represents the combined economic size, and larger economies tend to have greater trade volumes, implying α_3 . $Simgdp_{ij}$ captures economic similarity, defined as the product of each country's GDP share in the bilateral total; higher similarity is associated with stronger trade linkages, implying $\alpha_4 > 0$.

Relative factor endowment is measured by $Rgdppc_{ij}$, defined as the logarithm of the ratio of higher to lower GDP per capita. Following Orefice and Rocha (2014), greater differences in factor endowments increase potential gains from trade, implying $\alpha_5 > 0$. [2] However, to account for diminishing marginal benefits, a quadratic term $SqRgdppc_{ij}$ is included, with $\alpha_6 < 0$.

Country-pair types are captured by dummy variables. NN_{ij} equals 1 if both countries are high-income ("North–North"), and NS_{ij} equals 1 for "North–South" pairs. Developed economies are more likely to regulate digital trade through formal agreements; thus, $\alpha_7, \alpha_8 > 0$.

Digital-related variables include $Rnet_{ij}$, which measures differences in internet penetration and reflects the digital divide; larger gaps are expected to reduce agreement likelihood ($\alpha_9 < 0$). $Ricrg_{ij}$ captures differences in political risk; larger disparities discourage cooperation ($\alpha_{10} < 0$). $Rdtri_{ij}$ measures differences in digital trade restrictiveness; greater divergence implies higher negotiation costs and lower agreement probability ($\alpha_{11} < 0$).

To address potential endogeneity, two strategies are adopted. First, to mitigate reverse causality from time-varying variables, a static framework is employed by using pre-agreement cross-sectional data (e.g., values around 2000) and excluding time effects, consistent with standard cross-sectional gravity models. Second, to address omitted variable bias in discrete models, robustness checks are conducted by sequentially adding variables, using alternative measures of institutional and openness indicators, and controlling for additional factors such as common language and shared borders.

(2) Empirical Results

Table 4 reports the Probit regression results for the likelihood of signing digital services provisions. Columns (1)–(3) present the full-sample estimates.

Column (1) shows that $Dist$ is significantly negative, indicating that shorter distance increases the likelihood of agreement formation. $remote$ is significantly positive, suggesting that countries more distant from the rest of the world are more likely to form bilateral agreements. Both $Sumgdp$ and $Simgdp$ are significantly positive, confirming that larger and more economically similar countries are more likely to sign agreements. These results support Hypothesis 1.

Column (2) further incorporates country-pair types. The coefficients on geographic and economic variables remain robust. Both NN and NS are significantly positive, indicating that developed economies are more likely to engage in digital trade rule-making, thus supporting Hypothesis 2.

Column (3) includes digital-specific factors. $Rnet$ is significantly negative, suggesting that larger gaps in internet penetration (i.e., a wider digital divide) reduce the likelihood of agreement formation. $Ricrg$ is significantly negative, indicating that greater differences in political risk discourage cooperation. $Rdtri$ is also significantly negative, implying that larger differences in digital trade restrictiveness increase negotiation costs and hinder agreement formation.

Overall, these findings support Hypotheses 3–5, indicating that disparities in digital infrastructure, institutional stability, and regulatory openness play a crucial role in shaping the formation of digital services trade provisions.

Table 4. Probit regression results on the determinants of signing digital services trade provisions.

	The entire sample			Excluding the European Union		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Dist	-0.1846** (0.0720)	-0.1636** (0.0739)	-0.1692* (0.0982)	-0.2164*** (0.0814)	-0.2203*** (0.0839)	-0.2105* (0.1122)
remote	0.1778*** (0.0172)	0.1855*** (0.0178)	0.1732*** (0.0269)	0.1894*** (0.0197)	0.1988*** (0.0204)	0.2006*** (0.0312)
Sumgdp	0.1050*** (0.0395)	0.0091 (0.0435)	0.0385 (0.0563)	0.1994*** (0.0456)	0.1229** (0.0492)	0.1568** (0.0643)
Simgdp	0.1832*** (0.0480)	0.1019** (0.0510)	0.0638 (0.0661)	0.2022*** (0.0533)	0.1388** (0.0562)	0.1183 (0.0752)
Rgdppc	0.0463 (0.1431)	-0.1168 (0.1862)	0.1477 (0.2425)	0.0505 (0.1697)	0.0082 (0.2243)	0.1995 (0.2889)
sqRgdppc	-0.0243 (0.0366)	-0.0031 (0.0406)	0.0359 (0.0569)	-0.0237 (0.0441)	-0.0184 (0.0492)	0.0659 (0.0638)
nn		0.9614*** (0.1688)	0.7392*** (0.2119)		0.8666*** (0.1986)	0.5739** (0.2527)
ns		0.8251*** (0.1819)	0.5259** (0.2317)		0.5865*** (0.2087)	0.1814 (0.2716)
Rnet			-0.0166*** (0.0056)			-0.0111* (0.0065)
Ricrg			-1.7100** (0.6711)			-2.0644*** (0.7760)
Rdtri			-3.7184*** (0.9583)			-4.1457*** (1.0795)
Constant	-2.0095* (1.0606)	-0.4312 (1.1152)	-0.4742 (1.6826)	-4.5727*** (1.2183)	-3.2209** (1.2690)	-3.5272* (1.9342)
Sample	923.0000	923.0000	698.0000	801.0000	801.0000	581.0000
PseudoR2	0.3345	0.3673	0.3995	0.3550	0.3786	0.4091

*Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors are reported in parentheses.

To ensure the reliability of the baseline results, a series of robustness checks are conducted, including excluding specific samples and incorporating additional control variables. The overall findings remain highly stable.

Sample bias test. On the one hand, the European Union (EU), as a supranational entity, negotiates trade agreements as a single market rather than as individual member states. Treating EU-X agreements as multiple bilateral observations (i.e., “member state-X”) would lead to double counting of the same agreement and disproportionately increase the weight of EU-related observations. On the other hand, the explanatory variables in this study are constructed at the country-pair level. When the negotiating entity is the EU as a whole, the relevant measures should reflect the distance and institutional differences between the EU and its partner, rather than those of individual member states. Using member-state-level proxies may introduce systematic measurement errors and bias the estimates.

To address this issue, RTAs involving the EU as a unified negotiating entity are excluded in the robustness analysis. The results, reported in columns (4)–(6) of Table 4, show that the estimated effects remain largely unchanged, confirming the robustness of the baseline findings.

Omitted variable bias. Although the baseline model includes key determinants of digital services trade agreements, there may still exist omitted variables correlated with both the explanatory and dependent variables, such as common language and shared borders. To mitigate this concern, additional controls for common language and contiguity are included in the regressions. The results (reported in Table X) indicate that the coefficients on the core explanatory variables-*Ricrg*, *Rdtri*, and *rnet*-remain stable and statistically significant, further supporting the robustness of the empirical findings.

Table 5. Factors Affecting the Signing of Digital Service Trade Clauses: Test for Omitted Variables

Variable	The entire sample		Excluding the European Union	
	(1)	(2)	(3)	(4)
Dist	-0.0951 (0.1021)	-0.0939 (0.1037)	-0.1281 (0.1165)	-0.1151 (0.1186)
remote	0.1987*** (0.0287)	0.1989*** (0.0289)	0.2301*** (0.0334)	0.2326*** (0.0337)
Sumgdp	0.0792 (0.0590)	0.0789 (0.0592)	0.2113*** (0.0680)	0.2079*** (0.0683)
Simgdp	0.0987 (0.0681)	0.0985 (0.0682)	0.1656** (0.0782)	0.1638** (0.0784)
Rgdppc	0.2441 (0.2453)	0.2446 (0.2454)	0.3478 (0.2943)	0.3533 (0.2946)
sqRgdppc	0.0159 (0.0573)	0.0157 (0.0573)	0.0373 (0.0645)	0.0362 (0.0646)
nn	0.6261*** (0.2180)	0.6260*** (0.2180)	0.4259 (0.2614)	0.4216 (0.2615)
ns	0.4208* (0.2355)	0.4205* (0.2356)	0.0203 (0.2796)	0.0162 (0.2795)
Rnet	-0.0183*** (0.0057)	-0.0183*** (0.0057)	-0.0131** (0.0066)	-0.0132** (0.0066)
Ricrg	-1.9347*** (0.6872)	-1.9329*** (0.6876)	-2.4078*** (0.8031)	-2.3913*** (0.8036)
Rdtri	-2.5806** (1.0900)	-2.5810** (1.0900)	-2.8550** (1.2298)	-2.8618** (1.2288)
comcol	0.6873 (0.5715)	0.6884 (0.5717)	1.0420 (0.6585)	1.0517 (0.6584)
colony		0.0239 (0.3446)		0.2053 (0.3505)
Constant	-2.1709 (1.8172)	-2.1735 (1.8176)	-5.6425*** (2.1003)	-5.6818*** (2.1029)
N	678.0000	678.0000	561.0000	561.0000
PseudoR2	0.3940	0.3940	0.4093	0.4098

Note: *, **, *** indicate significance at the 10%, 5%, and 1% levels respectively. The values in parentheses represent the robust standard errors.

To further explore the impact of different sub-indicators of political risks and digital trade restrictions on whether a trade agreement is signed, we replaced the total indicators with the sub-indicators for empirical testing. The regression results are shown in the following table.

Among the 12 sub-indicators of political risk, the coefficients of the four indicators of social and economic environment, investment situation, corruption, and military interference in politics are significantly negative. While the other sub-indicators have no significant impact on whether a digital service clause is signed. The social and economic environment indicator reflects the pressure and vulnerability in a country's social and economic operation. Since digital services rely on the Internet and digital infrastructure for cross-border delivery, they are more dependent on a stable and predictable social and economic environment than traditional goods trade. The greater the differences between the two countries in this aspect, the more difficult it is to form a common expectation of digital rules, thereby reducing the possibility of signing related clauses. The investment situation indicator measures the institutional environment and risk level for foreign investment in a country. Investment is highly correlated with trade, and many RTAs directly embed digital trade content in the service and investment chapters. When a country's investment risk is significantly higher than that of its trading partners, to protect domestic investors and consumers, the party with lower risk is often more cautious, and the willingness of both parties to reach digital clauses also decreases. Corruption and military interference in politics reflect the integrity and institutional constraints of the governance system from different aspects. If there are large differences in these dimensions between the two countries, it not only raises the risk of contract performance and compliance costs, but also weakens the foundation of mutual trust, thus becoming a key institutional factor constraining the negotiation of digital trade clauses.

Table 6. Regression Table of Political Factors Sub-indicators for Digital Service Trade Agreements

	Governm ent stability	Socioecono mic conditions	Investm ent profile	Intern al conflict	Extern al conflict	Corr uptio n	Military in politics	Religiou s tensions	Law and order	Ethnic tension s	Democratic accountabili ty	Bureaucr atic quality
Ricrg1	0.4818	-1.2748***	1.6517** *	-0.5149	-0.5491	0.63 81*	0.9440* **	-0.0252	- 0.4198	- 0.0363	0.0405	0.2862
	(0.8160)	(0.2140)	(0.4713)	(0.447 2)	(0.7500)	(0.32 76)	(0.3340)	(0.3989)	(0.367 3)	(0.258 7)	(0.2225)	(0.4495)
Constant	-0.8829	-1.6393	-1.3955	-1.4108	-1.0192	0.83 60	-1.9487	-0.9745	- 1.3649	- 0.9738	-1.0435	-1.0301
	(1.7545)	(1.8028)	(1.7574)	(1.783 4)	(1.7495)	(1.75 29)	(1.7837)	(1.7474)	(1.776 6)	(1.746 6)	(1.7827)	(1.7477)
Number of observations (N)	678	678	678	678	678	678	678	678	678	678	678	678
Pseudo R	0.3840	0.4246	0.3984	0.3851	0.3842	0.38 78	0.3925	0.3837	0.3851	0.3837	0.3837	0.3841

*Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors are reported in parentheses.

Among the four subcomponents of digital trade openness, differences in trade restrictions exhibit the most significant effect, whereas differences in establishment (business) restrictions and data restrictions are not statistically significant. This suggests that policymakers place greater emphasis on disparities in fiscal and trade-related restrictions when deciding whether to include digital provisions in RTAs.

One possible explanation is that trade restrictions-such as quantitative restrictions, standards, online sales regulations, and transaction rules-directly affect the cross-border flow of digital goods and services. Larger differences in these areas increase firms' compliance costs and institutional barriers, making it more difficult for negotiating parties to reach agreement on the scope of liberalization and rule design, thereby reducing the likelihood of signing digital trade provisions.

In contrast, establishment restrictions (e.g., foreign investment limitations, intellectual property protection, competition policy, and business mobility) and data restrictions (e.g., data governance, cross-border data flows, and content access) tend to exert their influence through longer-term institutional adjustments and negotiations. As a result, their immediate impact on the binary decision of whether to sign digital provisions is relatively limited.

It is also noteworthy that the coefficients of all sub-indicators are generally negative and consistent with the overall index results. This indicates that greater convergence in digital trade openness between countries increases the likelihood of concluding RTAs that include digital services provisions.

Table 7. Regression results for subcomponents of digital services trade openness.

	(1)	(2)	(3)	(4)
Fiscal restrictions	-0.9476			
	(0.6285)			
Establishment (business) restrictions		-0.6873		
		(0.6370)		
Data restrictions			-0.0915	
			(0.5710)	
Trade restrictions				-2.2192***
				(0.7083)
Constant	-1.4938	-1.6130	-1.1472	-1.0792
	(1.7634)	(1.8082)	(1.7570)	(1.7643)
Control variables	Yes	Yes	Yes	Yes
Country 1 fixed effects	No	No	No	No
Country 2 fixed effects	No	No	No	No
Industry fixed effects	No	No	No	No
Number of observations (N)	678	678	678	678
Pseudo R2	0.3888	0.3876	0.3864	0.3972

5. Main Conclusion and Policy Implications

(1) Main Conclusion

Based on a quantitative analysis of regional trade agreement (RTA) texts and bilateral services trade data, this study systematically examines the determinants of negotiating digital services provisions, the factors affecting rule quality, and the heterogeneity of these effects across dimensions. The main conclusions are as follows.

The inclusion of digital services provisions is jointly shaped by three sets of factors: traditional gravity forces, institutional differences, and policy differences. Countries that are geographically closer, economically larger, and more similar in economic structure are more likely to incorporate digital services provisions into existing free trade agreements, which is consistent with the predictions of the classical gravity model. At the same time, larger gaps in political risk between the two parties-especially in terms of the socioeconomic environment, investment conditions, corruption control, and military involvement in politics-significantly reduce the probability of signing digital provisions. This suggests that similarity in political and institutional environments is an important precondition for embedding digital services rules in regional agreements. Likewise, greater differences in digital services trade openness, particularly in fiscal restrictions and trade restrictions, significantly reduce the likelihood that the two parties will conclude digital provisions.

(2) Policy Implications

First, China should continue to improve its domestic political and business environment in order to strengthen the institutional foundations for high-quality digital rule negotiations. The empirical results show that differences in the socioeconomic environment, investment conditions, corruption control, and military intervention in politics significantly affect both the likelihood of signing digital provisions and the quality of such provisions. China should therefore continue to advance law-based government, enhance the transparency and stability of macroeconomic policies, improve public service provision and the social security system, and foster a more predictable investment environment. At the same time, it should further reduce institutional transaction costs by deepening anti-corruption efforts, improving checks and constraints on the exercise of power, and enhancing administrative efficiency, thereby strengthening its credibility and bargaining power in digital rule negotiations through a more predictable and trustworthy political environment.

Second, in advancing digital trade rule negotiations, China needs to treat domestic reform and external negotiation as an integrated process. On the one hand, it should gradually reduce unnecessary restrictions on digital services trade, especially in the areas of fiscal and trade restrictions, by lowering discriminatory tax arrangements, quotas, and technical trade barriers targeting cross-border digital products and services. While safeguarding national security and data security, China should further raise the overall level of digital trade openness so as to create a stronger domestic institutional basis for participating in high-standard rule negotiations.

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