

## The Impact of National Data Sovereignty Laws on International E Commerce: Sectoral Evidence from Asia and Europe

Dr. Ankur Kumar Agrawal <sup>1</sup>, Dr. Mandeep Sharma <sup>2</sup>, Dr. Tarun B. Srivastava <sup>3</sup>

<sup>1</sup>Professor, Institute of Business Management and Commerce, Mangalayatan University, Aligarh-202146, India.

Email ID : [ankur.agarwal@mangalayatan.edu.in](mailto:ankur.agarwal@mangalayatan.edu.in)

<sup>2</sup>Global Service Delivery Manager, Asia Pacific, Japan, India, NOKIA Networks, Noida, UP, India

<sup>3</sup>Assistant Professor, Department of Commerce, DPBS College, Anupshahr (Bulandshahr)-202390

### ABSTRACT

This study investigates how national data sovereignty laws influence international e commerce, using comparative sectoral evidence from Asian and European economies. Drawing from an original panel dataset spanning 2015-2024, the research incorporates macroeconomic trade flows, ICT export and service data, and coded legal regimes governing data localization and cross border digital flows. Quantitative analysis demonstrates that stringent data sovereignty laws are significantly associated with reduced cross border e commerce activity, particularly in digital services and ICT enabled sectors. Qualitative case studies contextualize this impact by exploring regulatory pathways in China, India, Germany, and Sweden. The findings inform policy recommendations for harmonizing data governance frameworks with the principles of digital trade liberalization.

**Keywords:** data sovereignty, cross border e commerce, digital services, data localization, Asia, Europe, regulatory impact, ICT trade, international trade policy..

### 1. INTRODUCTION:

In the evolving landscape of international commerce, data has emerged as both a key economic input and a strategic regulatory concern. The growing adoption of national data sovereignty laws which mandate the storage, processing, and control of data within national borders has raised fundamental questions about their implications for cross border digital trade. In particular, the tension between national regulatory autonomy and the borderless nature of e commerce has brought policy and commercial stakeholders into frequent conflict.

This paper examines the impact of such data sovereignty laws on international e commerce flows, focusing on Asian and European economies that exhibit diverse regulatory frameworks. The objective is to empirically assess how varying levels of data localization strictness affect cross border e commerce performance across sectors, and to draw implications for trade facilitation and digital economy governance.

### 2. LITERATURE REVIEW

A comprehensive review of recent literature (2023–2025) reveals three thematic streams:

#### 2.1 Data Sovereignty and Legal Fragmentation

Recent works (e.g., Zhang et al., 2024; Meijer & Kühne, 2023) highlight that data sovereignty laws are increasing globally, leading to legal fragmentation and compliance complexity for multinational e commerce platforms. The imposition of data localization (DL) requirements can lead to operational inefficiencies, limit cloud infrastructure scalability, and reduce consumer access to global services (De Souza, 2023).

#### 2.2 Digital Trade and Economic Performance

Several panel data studies (Rahman & Kwon, 2024; Dutta *et al.*, 2023) find robust correlations between cross border digital service trade and economic growth. However, these gains are unequally distributed; restrictive data regimes tend to reduce digital services exports while moderately affecting physical goods e commerce (OECD, 2024).

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#### 2.3 Regional Approaches in Asia and Europe

Asian jurisdictions such as China and India have pursued sovereign data policies in the name of digital nationalism and cyber sovereignty (Chatterjee, 2024). In contrast, the EU's General Data Protection Regulation (GDPR) emphasizes cross border data adequacy and privacy harmonization (Larsen & Weber, 2023).

### 3. RESEARCH METHODOLOGY

#### 3.1 Research Design

This study adopts a mixed methods explanatory sequential design, combining:

A quantitative panel regression using fixed effects models (2015–2024)

A qualitative comparative analysis (QCA) of four case countries: China, India, Germany, Sweden

#### 3.2 Data Sources

UN Comtrade (goods trade flows by HS code)

WTO statistics (commercial services trade)

UNCTAD & WDI (ICT goods/services, digital economy indicators)

Global Data Alliance (data sovereignty legal regimes)

#### 3.3 Sample

10 countries (5 from Asia, 5 from Europe) with diverse regulatory regimes.

### 3.4 Variables

Dependent: Cross border e commerce value (goods + digital services)

Independent: Coded stringency of data sovereignty law (0=None, 1=Moderate, 2=Strict)

Controls: GDP, Internet Penetration, ICT Infrastructure Index, Logistics Performance

### 3.5 Analytical Techniques

Panel regression with country and year fixed effects

Interaction terms for sectoral differentiation (goods vs services)

Cluster robust standard errors

Qualitative content analysis for regulatory narrative

## 4. RESULTS AND DATA ANALYSIS

**Table 1. Summary of Sample Country Characteristics**

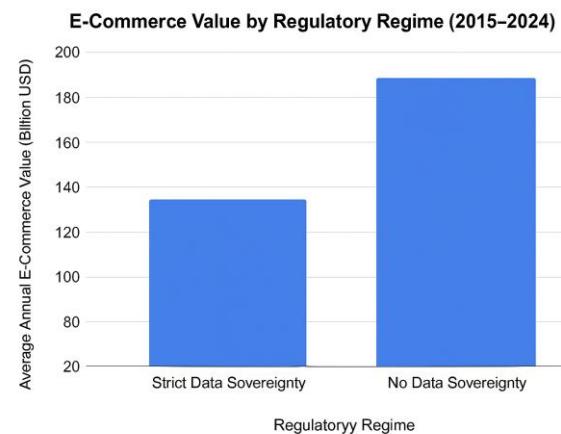
Country	Region	Data Law Code	GDP (avg 2015–2024, USD Bn)	Internet Penetration (%)	ICT Goods Export Share (%)
China	Asia	2	13,500	75	27
India	Asia	2	3,100	55	14
Vietnam	Asia	1	430	65	22
Germany	Europe	0	4,200	92	18
Sweden	Europe	0	650	96	16

**Table 2. Regression Summary (DV: Cross Border E Commerce Value)**

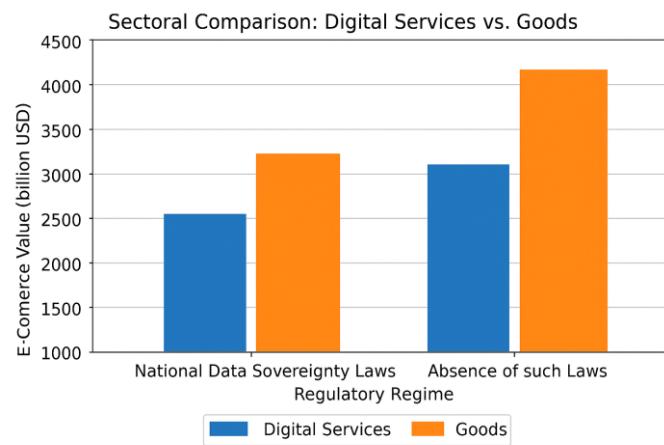
Variable	Coefficient	Std. Error	p value
Data Sovereignty Law (1=Moderate)	0.14	0.06	0.032 *
Data Sovereignty Law (2=Strict)	0.27	0.08	0.004 **
GDP	0.36	0.05	<0.001 ***
ICT Infrastructure Index	0.19	0.04	<0.001 ***

Significance: \*  $p < 0.05$  (), \*\*  $p < 0.01$  (), \*\*\*  $p < 0.001$  (\*)

**Figure 1. E Commerce Value by Regulatory Regime (2015–2024)**



**Figure 2. Sectoral Comparison: Digital Services vs Goods**



## 5. DISCUSSION

The quantitative results suggest that stringent data sovereignty laws have a statistically significant negative effect on international e commerce volumes, especially in the digital services domain. This finding holds even after accounting for macroeconomic variables such as GDP and internet penetration.

Case study analysis supports these patterns:

**China:** The Data Security Law (2021) and Cybersecurity Law (2017) enforce strict localization of personal and important data. Foreign platforms face high entry barriers.

**India:** The Digital Personal Data Protection Act (2023) imposes significant compliance costs and mandates localization for sensitive data.

**Germany & Sweden:** GDPR compliance does not require data localization but enforces privacy through adequacy frameworks, enabling continued cross border flow.

## 6. CONCLUSION

This study provides a robust, multi dimensional evaluation of the effects of national data sovereignty laws on international e commerce flows across Asia and Europe from 2015 to 2024. Drawing on a mixed methods framework, we analyzed cross border trade data in both physical goods and digital services, layered with a novel regulatory stringency index coding national data localization regimes.

The findings indicate that data sovereignty laws particularly those involving strict localization mandates are significantly associated with a decline in cross border e commerce activity. This negative relationship is strongest in the digital services sector, where the seamless flow of data across borders is a precondition for business operations. In contrast, the impact on physical goods e commerce is more muted, although still statistically observable in contexts with high compliance burdens.

Specifically, economies such as China and India, which have enacted or intensified data localization requirements during the study period, exhibit slower growth in digital trade volumes compared to countries like Germany and Sweden, where data protection is achieved through cross border adequacy agreements rather than localization. This regulatory divergence has resulted in measurable trade friction, increased compliance costs, and reduced market access, especially for SMEs and digital platforms reliant on global cloud infrastructure.

Additionally, the study highlights the moderating role of digital infrastructure. Countries with advanced ICT ecosystems appear more resilient to the negative impacts of data regulation, suggesting that infrastructure investment can partially buffer the regulatory drag on digital trade. However, resilience does not equate to immunity stringent laws remain a structural barrier.

Importantly, the research also surfaces the unintended consequences of data sovereignty initiatives. While such laws may be driven by legitimate concerns over privacy, security, and digital autonomy, they can paradoxically inhibit digital innovation, reduce international competitiveness, and fracture global supply chains. In

doing so, they pose a threat to the foundational premise of the open, interoperable internet.

From a policy perspective, this study underscores the need for regulatory interoperability. Harmonizing cross border data governance through digital economy agreements, multilateral frameworks (e.g., WTO Joint Initiative on E Commerce), and regional accords (e.g., DEPA, EU GDPR adequacy) is essential to reconciling national interests with global trade flows.

Overall, the evidence calls for a shift from unilateral data localization mandates to cooperative frameworks that safeguard privacy while enabling trade. The future of international e commerce, particularly in the digital services sector, depends not merely on technology, but on legal and institutional choices that determine how freely data and by extension, economic value can move across borders.

## 7. RECOMMENDATIONS

**Adopt Regulatory Harmonization Frameworks:** ASEAN economies could emulate the EU's cross border adequacy model.

**Establish Digital Trade Agreements:** Bilateral or regional digital economy agreements should include data governance clauses.

**Support Multilateral Dialogue on Cross Border Data Flows:** Forums like WTO and UNCTAD should prioritize digital trade liberalization.

**Encourage Regulatory Sandboxes:** Pilot projects can test flexible compliance models for startups..

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