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A Study on the Impact of Divergence in Cross-Border Data Flow Regulations on Global Digital Trade Imbalances and the Balance of Payments

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Abstract:

The digitalization of the global economy has positioned cross-border data flows as a central pillar of international trade. However, the governance of these flows is characterized by profound regulatory divergence, exemplified by the market-liberal model, the rights-based standards-exporting model, and the sovereignty-first model. These differing approaches function as Digital Trade Barriers, increasing transaction costs, disrupting Global Value Chains, and creating trade imbalances. A gap in the literature is the insufficient exploration of how these micro-level regulatory frictions aggregate into macro-level economic consequences, concerning the Balance of Payments (BoP). This study aims to bridge this gap by investigating the impact of divergent cross-border data flow regulations on global digital trade and BoP imbalances. The analysis concludes that regulatory divergence is a structural outcome of self-reinforcing asymmetries, producing distinct and self-reinforcing BoP outcomes for regulatory models. It finds that "managed pluralism" through technical interoperability and mutual recognition is the only viable path forward. The research significance is twofold: theoretically, it bridges trade theory and macroeconomics by showing how firm-level regulatory costs aggregate into BoP imbalances; practically, it provides a framework to inform policy debates within international institutions like the WTO and IMF, emphasizing the need for executive-led strategies and redistributive mechanisms to address structural imbalances and ensure global digital stability.

Keywords:

Cross-border data flow regulations, Digital Trade Barriers, Global digital trade imbalances, Balance of Payments, Global Value Chains

1.Research Background

The rapid advancement of digital technologies continues to reshape the global economy, with data flows becoming the central artery of international trade. Unlike traditional trade, modern commerce is ever more dependent on the cross-border movement of data to facilitate everything from supply chain management and service delivery to digital platforms. This shift has given rise to digital trade—commercially enabled trans-

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actions that are digitally ordered and/or delivered—which now constitutes a critical and growing segment of global economic activity. According to UNCTAD data, Global digital services trade has experienced remarkable expansion, growing from approximately $1.83 trillion in 2010 to $4.95 trillion in 2024—a 170% increase representing an average annual growth rate of 8.5% (2025). This acceleration has been particularly pronounced in the post-pandemic period, reflecting the deepening structural integration of digital services into global commerce.

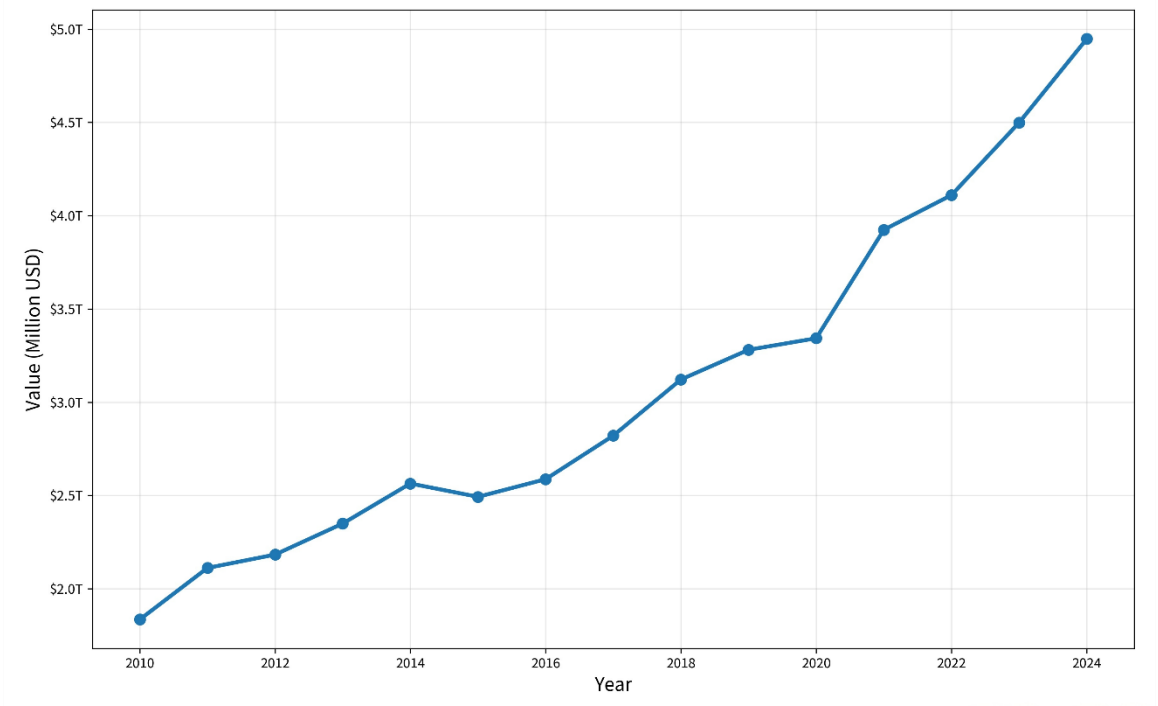


Figure 1: Global Digitally Deliverable Services Trade Trend

Source: UNCTAD Data Hub

The geographical distribution of this growth, however, reveals significant asymmetries. UNCTAD data reveals that in 2024, Europe commanded 52.9% of global digital services exports, followed by Asia (26.5%) and the Americas (19.1%), while Africa (0.9%) and Oceania (0.6%) remained marginal participants. At the country level, stark disparities persist: the United States leads with $759.9 billion in digital services exports, followed by the United Kingdom ($501.7 billion), India ($292.4 billion), Germany ($284.5 billion), China ($225.0 billion), France ($210.4 billion), and Japan ($120.9 billion). Notably, G20 countries collectively account for 55.6% of global digital services trade, underscoring the concentrated nature of digital economic activity among major economies.

However, the governance of digital trade is significantly fragmented. Nations have adopted starkly different regulatory approaches to cross-border data flows, driven by varying priorities regarding privacy, security, industrial policy, and technological sovereignty. A clear divergence exists between "accessible" models, such as those in the CPTPP and USMCA which promote data flow liberalization, and "conservative" models, exemplified by the EU's GDPR, which impose strict conditions on data transfers (Bodó et al., 2021; Micheli et al., 2020). Developing countries, as evidenced by initiatives like the Digital Development Clause led by South

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Africa and India, are also crafting distinct regulatory spaces, often implementing data localization mandates and market access restrictions to protect nascent digital industries and assert data sovereignty.

This regulatory divergence is not without consequence. These measures function as a new generation of non-tariff barriers—Digital Trade Barriers (DTBs)—that increase transaction costs (Pasadilla & Duval, 2020; Jin & Pan, 2025), impede collaborative innovation, and constrain market access. For instance, data localization requirements force enterprises to build redundant infrastructure and disrupt efficient data integration within Global Value Chains (GVCs). The empirical evidence reveals a complex pattern: while emerging economies like China (301.7% growth) and India (268.5% growth) have demonstrated exceptional dynamism in digital services exports between 2010 and 2024, significantly outpacing developed nations such as Japan (94.3%) and France (120.9%), broader structural inequalities persist. Developing countries excluding China grew by 238%, yet the least developed countries (LDCs), despite achieving 78.8% growth, increased their absolute exports only from $4.56 billion to $8.14 billion—a figure that remains negligible relative to global totals. Asia's market share expansion from 20.5% to 26.5% occurred alongside Europe's slight contraction from 55.2% to 52.9%, suggesting a gradual rebalancing—yet Africa's stagnation at 0.9% global share underscores the digital divide.)

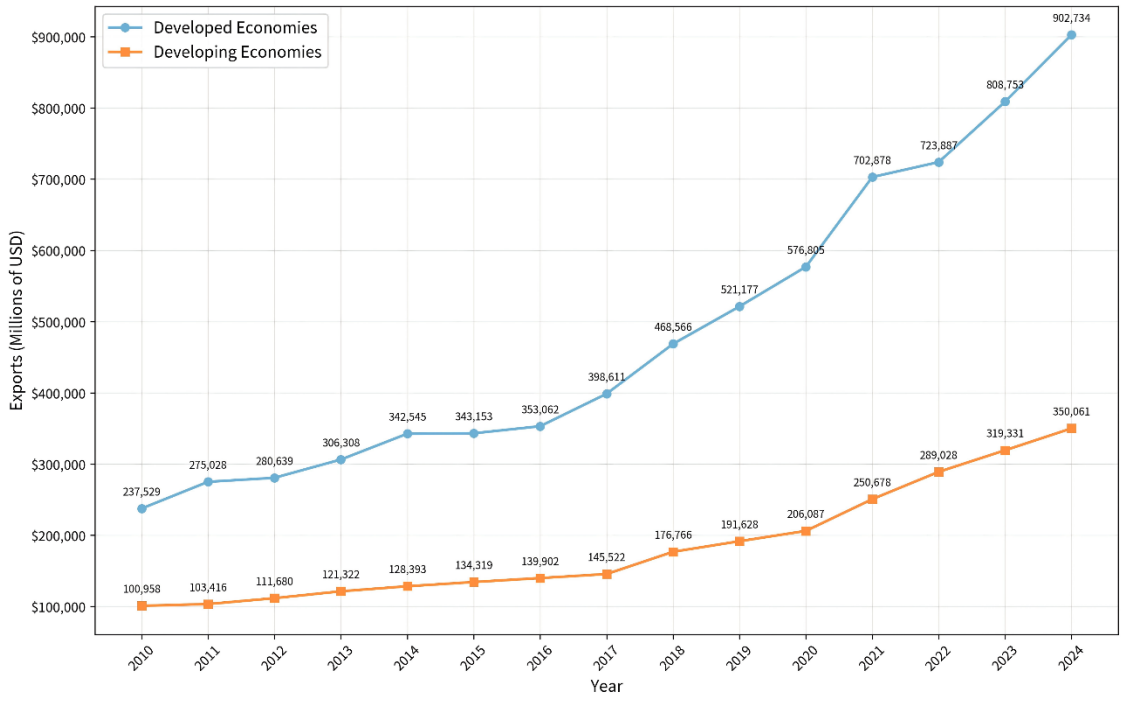


Figure 2: Comparison of Digital Deliverable Service Exports: Developed vs Developing Economies (2010-2024)

Source: UNCTAD Data Hub

A critical gap in the existing research is the insufficient exploration of how these micro-level regulatory frictions aggregate into macro-level economic imbalances, particularly concerning the Balance of Payments (BoP). While studies examining the effects of BoP dynamics on firm operations exist, the reverse causality—how firm-level frictions arising from data regulations aggregate into BoP imbalances—remains systematically

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underexplored. A rigorous analysis linking regulatory divergence to BoP outcomes is notably absent, creating a significant explanatory-prescriptive gap in our understanding of how the structural tension between technology monopoly and digital sovereignty (Jin & Pan, 2025) translates into macroeconomic outcomes.

Therefore, this study seeks to bridge this gap by investigating the impact of divergence in cross-border data flow regulations on global digital trade imbalances and the Balance of Payments. The practical implications of this study are predominantly aimed at informing policy and enhancing economic monitoring. By constructing a framework that links regulatory heterogeneity to tangible trade and financial outcomes, this study would offer a tool to assess the impact of data governance models on global macroeconomic stability. The findings could inform policy debates on the future of digital cooperation and rule-making within key international institutions, such as the World Trade Organization (WTO) and the International Monetary Fund (IMF). The theoretical implications of this study are aimed at two primary directions: (1) connecting trade theory and macroeconomics, it may bridge the gap between firm-level analysis of digital trade barriers and macroeconomic accounting by showing how regulatory costs can aggregate into measurable imbalances in a nation's services account; (2) adding an economic dimension to IPE, it may complement existing political economy theories by offering a framework to analyze their effects. Specifically, it aims to scale up the three-dimensional model (technology, data, policy) used to analyze GVC impacts (Jin & Pan, 2025) to the macroeconomic level, examining its manifestation across the components of the Balance of Payments.

2.Literature Review

2.1.Theoretical Foundations

2.1.1.Non-Tariff Measures Theory

Non-Tariff Measures (NTM) theory explains how domestic regulations function as de facto barriers to trade. The theory posits that such measures increase trade costs through compliance requirements, information asymmetries, and regulatory uncertainty. This framework is applied here to conceptualize data governance rules—such as data localization and cross-border transfer restrictions—as a new class of Digital Trade Barriers (DTBs).

A central insight is that regulatory heterogeneity—the existence of divergent standards across countries—is often more costly than a single, harmonized standard because it prevents economies of scale in compliance (Pasadilla & Duval, 2020). This guides the study's focus on the divergence between regulatory systems as the primary trade barrier, rather than the restrictiveness of a single country's regime.

Furthermore, NTM theory establishes that these barriers are non-neutral. Their costs disproportionately affect smaller firms and developing economies, which often lack the resources to navigate multiple legal systems or influence international standard-setting (Hammad et al., 2021). This prediction of asymmetric impact provides the rationale for this study's core hypothesis: that the Balance of Payments consequences of DTBs will fall more heavily on developing countries.

2.1.2.Global Value Chain Theory

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Global Value Chain (GVC) theory examines how production is fragmented across borders, with firms and countries positioning themselves within internationally dispersed networks where value is added at each stage (Jin & Pan, 2025). This moves beyond a focus on finished goods to analyze the trade in tasks and intermediate inputs.

A core insight of GVC theory is that participation and upgrading to higher-value activities depend on seamless coordination and knowledge flows (Pasadilla & Duval, 2020). In modern production, data flows serve as this essential coordinating infrastructure. Therefore, barriers to data do not merely add costs but can compromise the operational efficiency that makes geographically fragmented production viable.

The theory also provides the concepts of "upgrading" (moving to higher-value tasks) and "downgrading" (relegation to lower-value segments). This framework predicts that data governance restrictions can create a "system trap," systematically excluding developing countries from high-value, data-intensive activities like R&D and platform coordination, and confining them to lower-value roles (Jin & Pan, 2025).

This exclusion creates path dependency, as the inability to participate in high-value activities inhibits the learning and capability accumulation required for future upgrading. The theory thus provides a causal mechanism linking regulatory barriers to structural economic outcomes: facing such restrictions, firms reconfigure supply chains, leading to observable shifts in national trade and investment patterns.

2.2.Cross-Border Data Flow Regulations

Global regulations for cross-border data flows are characterized by geopolitical divergence. Data governance has become a central arena of competition where regulatory choices are inseparable from strategies for economic competitiveness and technological sovereignty (Bodó et al., 2021). This fragmentation is driven by three conflicting paradigms.

The United States exemplifies a market-driven approach that treats data as an economic commodity to be traded with minimal friction. Its domestic framework is sectoral, with specific rules for industries like healthcare (HIPAA) rather than comprehensive legislation, prioritizing commercial innovation (Coche et al., 2024). Internationally, the US actively promotes data flow liberalization through trade agreements, seeking to prohibit data localization. This policy is deeply linked to the global dominance of US technology firms, whose business models rely on processing data at a global scale (Bodó et al., 2021; Jones, 2023).

In sharp contrast, the European Union has developed a rights-based model centered on data protection as a fundamental human right. The General Data Protection Regulation (GDPR) permits data transfers only to jurisdictions providing "adequate" protection, effectively making EU standards a precondition for market access (Coche et al., 2024). This has created the "Brussels Effect," where EU privacy norms gain global influence (Bradford, 2020). While rooted in normative commitments, this model also functions as strategic economic statecraft, imposing high compliance costs on the data-intensive business models of dominant US firms, a tension evident in the invalidation of transatlantic data transfer agreements (Jones, 2023).

A third, state-centric paradigm, most prominently advanced by China but also evident in countries like India and Russia, treats data as a strategic national resource. This model is defined by strict data localization mandates that require certain data to be stored within national borders, subject to government access (Pasadilla

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& Duval, 2020). China's legal framework segments data into categories with stringent transfer restrictions, justified by national security, industrial policy, and political control (Duan, 2025; Bodó et al., 2021). While China's model is comprehensive, the underlying logic of data sovereignty resonates elsewhere, with countries like India pursuing localization for developmental and post-colonial reasons (Coche et al., 2024).

The coexistence of these incompatible paradigms has produced a fragmented global landscape. Each model embodies different values (commerce, rights, or sovereignty) and priorities (efficiency, protection, or control), reflecting deep political and legal divergences that resist harmonization (Fletcher, 2023). This fragmentation creates more than just firm-level compliance costs; it undermines the ability of international organizations to develop the harmonized standards necessary for accurate macroeconomic measurement. When major economies define and govern data differently, it cripples the ability to compile reliable statistics, creating a dual challenge of economic barriers for firms and an informational deficit for policymakers (Carboni et al., 2023).

2.3.The Impact of Differences in Cross-Border Data Flow Regulations on Global Digital Trade Imbalances

The differences in cross-border data flow regulations across the US, EU, and China are not neutral in their effects; they function as Digital Trade Barriers (DTBs) that actively create and exacerbate imbalances in global digital trade. These divergent regulatory requirements force firms to navigate a complex and costly legal landscape, with measures like data localization requiring redundant infrastructure and fragmenting operations (Pasadilla & Duval, 2020; Duan, 2025). Beyond raising costs, this regulatory fragmentation disrupts the efficiency of data-dependent Global Value Chains (GVCs), prompting companies to reconfigure supply chains away from more restrictive jurisdictions. This process disproportionately harms developing countries and smaller enterprises, which lack the resources to manage multi-jurisdictional compliance (Jin & Pan, 2025).

Empirical evidence shows these mechanisms are aggregating into significant global imbalances. The share of digital services exports from developing countries has systematically eroded, with the gap relative to developed countries widening from 26 percentage points in 2015 to 44 in 2023 (Jin & Pan, 2025). This divergence suggests a structural "Matthew effect," where initial advantages in infrastructure and regulatory capacity in developed nations compound over time.

These trade imbalances extend to technological capabilities, solidifying a "technology monopoly pattern" that constrains development. The patent share held by developed countries in strategic fields like artificial intelligence and cloud computing increased from 71% to 83% between 2015 and 2023 (Jin & Pan, 2025). This technological entrenchment traps developing economies in lower-value GVC segments, as restricted data mobility and policy volatility prevent them from upgrading to innovation-intensive roles. Country-level evidence illustrates this dynamic: Brazil's data localization policy for cloud computing resulted in the localization of only low-value infrastructure, with core algorithms remaining in the US, locking the country into a subordinate position (Jin & Pan, 2025). Similarly, in WTO negotiations, African nations' demands have been rejected on the basis of technical standards calibrated to the existing capabilities of advanced economies, reinforcing the structural disadvantages faced by developing countries. These findings indicate that differences in data flow regulations are a primary driver of the widening structural divide in the global digital economy.

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2.4.The Impact of Differences in Cross-Border Data Flow Regulations on the Balance of Payments

To understand the systemic impact of divergent data flow regulations, it is first necessary to establish the Balance of Payments (BoP) as the core analytical framework. The BoP provides the accounting structure for recording all economic transactions between a country's residents and non-residents, typically organized into the current, financial, and capital accounts. A fundamental principle of the BoP is that these accounts are systematically linked. This framework connects a country's external position to its domestic economy by linking the current account balance to the gap between national saving and investment. As a result, BoP imbalances have implications for exchange rate stability, external debt, and monetary policy autonomy (Mourougane, 2025).

For this study, the BoP framework is crucial because it moves the analysis beyond the firm or sectoral level to assess the comprehensive impact on a nation's entire external account. It allows for tracing how the effects of Digital Trade Barriers (DTBs) propagate across the system. Furthermore, this framework introduces a dynamic dimension, helping to assess whether sectoral disruptions translate into persistent external imbalances that threaten macroeconomic stability. By providing a standardized, internationally comparable metric compiled according to a shared IMF methodology, the BoP serves as the dependent variable for evaluating whether digital trade governance is a marginal issue or a systemic challenge.

While the literature documents how regulatory divergence creates sectoral imbalances, it has not systematically traced how these distortions manifest across the BoP. The framework, however, allows for the identification of likely transmission mechanisms. The erosion of developing countries' digital service exports would weaken the services balance within the current account. Simultaneously, the increased costs and uncertainty caused by regulatory fragmentation deter foreign investment in data-intensive sectors, negatively impacting the financial account. This "micro-to-macro disconnect" is compounded by measurement challenges that obscure the full BoP impact. The intangible nature of digital trade is difficult for statistical systems, designed for physical goods, to capture accurately (Kersan-Škabić, 2021). The issue is acute for developing economies, where informal digital commerce is substantial but largely unrecorded. The rise of crypto-assets exemplifies this problem: a shift of remittances from formal banking to unrecorded crypto channels could cause official BoP statistics in receiving nations to underestimate inflows, distorting macroeconomic aggregates (Carboni et al., 2023). Consequently, while the existing literature suggests that differences in data regulations are poised to have a profound and asymmetric impact on national BoP structures, the full scale of the effect is likely understated and remains underexamined, representing a research gap.

3.Analysis

3.1.Analysis of Motivations

The divergence in cross-border data flow regulations and its impact on global digital trade imbalances and the Balance of Payments (BoP) is a systemic outcome driven by self-reinforcing motivations. This section analyzes the dual nature of these motivations. First, it examines the motivations that drive nations to adopt

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divergent regulatory approaches. Second, it analyzes how these motivations translate into mechanisms that impact digital trade flows and BoP dynamics. These motivations interact cumulatively, causing regulatory divergence and perpetuating its economic consequences.

Table 1: Exports of Telecommunication, Computer and Information Services by Selected Economies, 2010-2024

Economy	2010	2015	2020	2024
Bangladesh	$313	$482	$405	$702
China	$10,476	$25,784	$59,034	$100,282
China, Taiwan Province Of	$601	$2,032	$4,726	$8,007
Cyprus	$695	$1,327	$4,265	$9,240
India	$54,244	$55,046	$65,997	$122,879
Indonesia	$1,240	$971	$1,276	$3,760
Ireland	$37,490	$58,465	$167,904	$295,619
Lao People's Dem. Rep.	$27	$34	$37	
Lithuania	$138	$268	$1,083	$2,773
Maldives	$45	$87	$31	$47
Philippines	$2,236	$3,461	$5,930	$8,085
Poland	$2,008	$4,400	$9,407	$19,612
Singapore	$3,543	$8,873	$19,443	$30,795
Timor-Leste	$6	$4	$1	$2
United States	$26,556	$41,427	$60,271	$90,783
Developing Economies	$100,958	$134,319	$206,087	$350,061
Developed Economies	$237,529	$343,153	$576,805	$902,734
European Union (2020 …)	$172,729	$218,313	$389,358	$604,152
World	$338,488	$477,472	$782,892	$1,252,795

Source: UNCTAD Data Hub

3.1.1.Asymmetric Initial Conditions and Market Fragmentation

The primary motivation stems from asymmetries in the digital capabilities and regulatory philosophies of nations—a core premise of CCC where initial conditions create path dependence. Developed economies, notably the United States and the European Union, entered the digital era with advantages: dominance of their firms, advanced infrastructure, and established regulatory traditions—the U.S. favoring a market-liberal approach and the EU a rights-based one (Bodó et al., 2021; Jones, 2023).

This asymmetry motivates fundamentally different regulatory responses. The power of U.S. technology firms provoked an EU response aimed at asserting control and protecting rights, epitomized by the GDPR (Coche et al., 2024). The U.S., in turn, is motivated to preserve its firms' competitive advantages by advocating for minimal restrictions on cross-border data flows. Conversely, developing countries, lacking comparable "resource stocks" (Gong & Binz, 2023), are motivated by dual concerns: first, the need to protect nascent domestic digital industries from being overwhelmed by foreign incumbents; and second, security imperatives that make dependence on external data infrastructure appear risky (Jin & Pan, 2025).

This initial asymmetry initiates a cumulative cycle of motivated regulatory divergence. Each jurisdiction's

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response to its starting position—whether to leverage existing advantages, protect fundamental values, or defend against perceived vulnerabilities—reinforces the original asymmetry. The regulatory choices themselves become new structural factors that motivate further divergent responses by others, creating a self-perpetuating spiral. The EU's GDPR, for instance, motivated by its position as a regulatory power without dominant tech firms, provokes defensive localization measures by countries seeking to avoid European regulatory hegemony, which in turn motivates U.S. advocacy for "free flow" provisions in trade agreements to counteract both trends.

3.1.2.Irreconcilable Policy Objectives and Innovation Constraints

The second cluster of motivations arises from tension between policy objectives that nations prioritize differently, leading to path-dependent regulatory trajectories. CCC highlights how interrelated variables and historical trajectories shape and lock in outcomes (O'Hara, 2008). Nations face a trade-off between promoting economic efficiency through data flows and upholding objectives such as privacy, national security, cultural sovereignty, and public morals (Hammad et al., 2021; Pasadilla & Duval, 2020).

Crucially, these objectives are not merely different in degree but often irreconcilable in kind. Prioritization of these objectives motivates and hardens divergent paths: the EU's motivation is rooted in treating privacy as a fundamental right, leading to a "risk-averse" regulatory model that accepts economic costs for rights protection (Bodó et al., 2021); China's regulations are motivated by national security and social stability, treating data as a strategic asset requiring state oversight (Duan, 2025); many developing countries are motivated by economic development goals, using data policies as tools for industrial protection and technological catch-up (Jin & Pan, 2025); while the U.S. regulatory approach is motivated by the belief that market forces and innovation are best served by minimal ex-ante regulation.

Once a jurisdiction embarks on a regulatory path motivated by these distinct objectives, the development of institutions, legal precedents, stakeholder expectations, and vested interests creates inertia that cumulatively reinforces that path (O'Hara, 2008). The motivation for continued divergence becomes self-sustaining: regulatory bureaucracies develop specialized expertise and institutional cultures around their chosen approach; domestic firms adapt their business models to comply with and even benefit from local rules; civil society coalitions form to defend achieved protections; and politicians face domestic pressure to maintain or strengthen regulations that reflect nationally salient values. This path dependency ensures that conflicting objectives are not easily reconciled, cementing divergence even when its economic costs become apparent.

3.1.3.Digital Sovereignty as an Accelerant and Systemic Reinforcement

The third motivation is the quest for "digital sovereignty," which acts as a catalyst within the cumulative process. This motivation is a consequence of the asymmetries and conflicts described above. As digital economies become central to national power and economic competitiveness, states are motivated to reduce dependencies and assert control over their digital futures (Coche et al., 2024; Bodó et al., 2021). Unlike the previous motivations, which are rooted in economic position or value preferences, digital sovereignty is a strategic, geopolitically-motivated response to perceived vulnerabilities in an increasingly data-dependent world.

This pursuit manifests differently based on a nation's position. For the EU, digital sovereignty is motivated

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by the desire to assert regulatory autonomy in the face of U.S. technological dominance and to prevent European data and digital markets from being controlled by foreign entities (Jones, 2023). For China and other major emerging economies, it is motivated by the imperative to secure national infrastructure and to create domestic champions that can compete globally (Duan, 2025). For smaller developing countries, sovereignty concerns are motivated by fears of technological dependency and permanent subordination in the digital economy hierarchy (Jin & Pan, 2025).

Critically, the pursuit of sovereignty creates a powerful feedback loop of motivated divergence. Measures taken by one power to assert sovereignty—whether the EU's GDPR, China's data localization mandates, or India's restrictions on cross-border data transfers—are perceived by others as attempts to impose external regulatory control or to gain asymmetric advantages. This perception motivates defensive or assertive responses: the EU's regulations motivate U.S. concerns about "digital protectionism"; China's localization motivates reciprocal restrictions by other countries; attempts by any jurisdiction to set global standards motivate counter-coalitions. This creates a cycle where the pursuit of sovereignty by one actor directly motivates similar pursuit by others, cumulatively leading to a fragmented global regulatory landscape (Coche et al., 2024). The motivation becomes self-reinforcing at the system level: the more fragmented the landscape becomes, the more each jurisdiction feels compelled to assert its own sovereignty to avoid being dominated by others' rules.

3.2.Analysis of Modes

3.2.1.The Standards-Exporting Model

The European Union's General Data Protection Regulation (GDPR) exemplifies a regulatory model that protects fundamental human rights while leveraging its market power to shape global standards (Bodó et al., 2021; Jones, 2023). This framework establishes high benchmarks for data protection, privacy, and algorithmic accountability, enforced through controls over access to the EU's market of 450 million affluent consumers. Consequently, multinational firms often adopt these standards globally to streamline operations, thereby externalizing the EU's regulatory preferences beyond its borders (Bradford, 2020, as cited in Jones, 2023).

As a result, a cycle of competitive advantage emerges. When other jurisdictions emulate the GDPR—such as Brazil, Indonesia, and India—EU-based firms and consultancies gain a significant first-mover advantage. They already possess the necessary compliance infrastructure, legal expertise, and certification processes, while firms from other regulatory regimes face recurring adaptation costs that create a cumulative competitive disadvantage (Duan, 2025). Furthermore, these high compliance costs act as a filter: they create prohibitive market entry barriers for smaller firms and startups from developing countries, which lack the resources for data protection officers and legal counsel. This, in turn, reduces competitive pressure on incumbent platforms that can absorb these costs (Kersan-Škabić, 2021).

This dynamic is further reinforced as dominant platforms, having invested heavily in compliance, gain privileged access to policymakers as implementation "experts." This creates opportunities to shape subsequent regulations (like the Digital Markets Act and AI Act) in ways that entrench existing market structures while appearing to constrain them, ultimately reducing incentives for disruptive innovation (Fletcher, 2023; Jones, 2023).

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In the end, this regulatory mode consolidates the digital trade position of the standard-setting bloc. While EU-based firms may not dominate global platforms, the EU itself becomes a major exporter of regulatory services—including consultancies, legal expertise, and compliance technologies. The balance of payments effect is dualistic: the EU continues to import services from U.S. platforms, but this is partially offset by its exports of standards and certifications. More significantly, the model erects barriers that protect EU digital markets from new entrants from developing countries, thereby preserving market share for established incumbents.

3.2.2. The Regulatory Fragmentation Model

This mode, prevalent in many developing economies, is characterized not by a coherent strategy but by institutional incapacity, policy volatility, and fragmented implementation—a phenomenon termed "policy wobble" (Jin & Pan, 2025; Pasadilla & Duval, 2020). The initial trigger for this dynamic is weak governance capacity and a lack of a coherent digital strategy, which creates profound regulatory uncertainty. This is exemplified by Indonesia's severe shortage of qualified data compliance lawyers and IT auditors, which means that even well-intentioned laws cannot be effectively implemented or enforced (Jin & Pan, 2025).

This uncertainty, in turn, initiates several reinforcing feedback loops. First, a significant investment chilling effect occurs, as policy volatility makes long-term investment untenable. For instance, Brazil's adjustment of cloud computing foreign ownership limits three times in five years exemplifies this pattern (Jin & Pan, 2025). When regulatory environments are so unpredictable, both foreign and domestic investors delay commitments, thereby depriving the digital sector of the capital crucial for its development.

A second, compounding loop is the exclusion of SMEs and the burden of fragmented compliance. Regulatory misalignment across jurisdictions forces businesses, particularly those operating regionally, to absorb redundant compliance costs. Southeast Asia's substantial regulatory fragmentation (Pasadilla & Duval, 2020) means that firms must navigate conflicting requirements. This disproportionately harms small and medium-sized enterprises (SMEs), which lack the necessary legal resources, ultimately limiting their participation in regional digital value chains and preventing the emergence of dynamic local competitors.

These factors converge into a third loop of capability stagnation and a vicious cycle. The lack of investment prevents the accumulation of financial, human, and technological resources needed for digital sector upgrading. Governments, facing pressure from a lagging digital sector, may then enact further unpredictable interventions—such as sudden taxation changes or emergency localization mandates—which only deepens the initial uncertainty. The focus consequently shifts from strategic capability building to "fire-fighting" immediate compliance crises.

The cumulative impact of this fragmentation model on trade and the balance of payments is structurally negative. The persistent instability prevents economies from achieving the scale and coherence necessary to develop competitive digital service exports. As a result, countries remain locked in a position as net consumers of foreign digital services—importing cloud infrastructure, software, and platforms—without developing viable domestic alternatives or export capacity. This almost guarantees persistent deficits in the digital services trade account, creating ongoing foreign exchange pressures as rising digital imports drain reserves.

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3.2.3.The Sovereignty-First Model

This mode, exemplified by China, Vietnam, and increasingly India, operationalizes the motivation for national security and technological autonomy through strict data localization, mandatory source code disclosure, and restrictions on foreign digital service providers (Duan, 2025; Jin & Pan, 2025). In this framework, data is treated as a strategic asset requiring domestic control.

These policies are triggered by mandatory localization and technology transfer requirements, which force a fundamental restructuring of global digital operations. Consequently, multinational firms must choose between fragmenting their operations to comply or exiting the market entirely. This initial trigger then sets in motion several reinforcing feedback loops.

One significant loop involves the "short-chaining" of supply chains. Forced localization substantially increases coordination costs, leading multinationals to fragment regional supply chains into isolated "one-country-one-chain" models to comply with conflicting mandates. For instance, Vietnam's requirement for foreign automakers to disclose autonomous driving source code resulted in several firms providing "redacted" versions or abandoning advanced features in that market, thereby reducing the host country's access to cutting-edge technology (Jin & Pan, 2025).

A second, related loop leads to technology dilution and innovation constraints. Although these policies aim for self-reliance, they often result in receiving diluted technologies, as foreign firms protect core intellectual property by limiting transfers or providing simplified versions. The consequence of this is that local industries can become trapped in a cycle of "import-stagnation-reimport," where technological dependence persists but at lower levels (Jin & Pan, 2025).

Simultaneously, a third feedback loop focuses on market segmentation and domestic champion creation. By creating protected domestic markets, localization shields national champions—like Alibaba and Tencent in China—from foreign competition, allowing them to develop. However, this isolation can also dampen innovation efficiency by cutting off access to global competition and knowledge spillovers, even as it builds domestic capacity.

Ultimately, these mechanisms have a distinct impact on trade and the balance of payments (BoP). This mode generates dualistic BoP effects: in the short term, the services account may deteriorate due to efficiency losses from fragmented operations, while import substitution reduces services imports in basic digital infrastructure. The long-term outcome, however, depends on whether domestic firms achieve genuine innovation capacity. While China's success suggests the model can work with sufficient market size and state support, smaller economies like Vietnam and Indonesia often experience a different reality. They face persistent efficiency losses without achieving competitive domestic industries, resulting in a constrained, less innovative digital economy. In such cases, ongoing BoP pressures emerge as consumers continue to seek superior foreign alternatives through informal channels.

3.2.4.The Market-Liberal Mode

The market-liberal model, exemplified by the United States and Singapore, is fundamentally oriented to-

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ward maximizing innovation and market efficiency. This is operationalized through minimal ex-ante regulation of data flows, with policies that emphasize sectoral self-regulation, voluntary frameworks, and ex-post enforcement (Bodó et al., 2021). A key characteristic is the limited restriction on cross-border data transfers, which are typically governed only by sector-specific rules for areas like finance and health.

This institutional framework is set in motion by its low regulatory barriers, which create an environment where network effects can operate without friction. As a result, digital platforms can rapidly scale across borders, accumulate vast amounts of user data, and leverage that data for algorithmic improvements, all while avoiding the costs of compliance fragmentation. This initial trigger catalyzes a series of self-reinforcing feedback loops that cement the dominance of early movers.

The first of these loops is the amplification of network effects. Minimal regulation allows platforms headquartered in market-liberal jurisdictions to achieve global scale at an accelerated pace. In line with Metcalfe's Law, each additional user increases the platform's value, creating winner-take-most dynamics. As platforms like Google, Meta, and Amazon accumulate billions of users, they generate data advantages that become insurmountable for new entrants (Fletcher, 2023).

This process is further accelerated by a second loop of data-driven innovation. Unrestricted data access enables continuous algorithmic refinement, allowing platforms to use behavioral data to improve services. This, in turn, attracts more users, generates even more data, and progressively widens the competitive moat, creating a cumulative innovation advantage for firms based in market-liberal jurisdictions.

Concurrently, a third loop drives the concentration of capital. The expectation of minimal regulatory intervention makes market-liberal jurisdictions highly attractive to venture capital and foreign direct investment. For instance, the U.S. received 56% of global digital economy FDI between 2018-2022, which provides entrenched firms with the resources for further innovation and market expansion (UNCTAD, 2023).

The cumulative impact of these mechanisms on trade and the balance of payments is profound. This model generates persistent and growing services trade surpluses that are heavily concentrated in market-liberal economies. The structural BoP impact involves large current account surpluses in digital services—such as advertising, cloud computing, and SaaS—which are often matched by capital account outflows as firms reinvest profits abroad. It is crucial to note, however, that the model's success is contingent upon achieving critical network effects before other jurisdictions erect regulatory barriers, creating first-mover advantages that are exceptionally difficult to reverse.

3.2.5. Comparative Dynamics and Mode Interrelationships

The four digital governance modes are not mutually exclusive; countries often exhibit characteristics of multiple models simultaneously, which can lead to contradictory policy outcomes. This tension is exemplified by Mexico's endorsement of USMCA provisions promoting data flows while simultaneously imposing healthcare data localization, illustrating how Fragmentation Model characteristics can overlap with attempted Sovereignty-First policies (Jin & Pan, 2025).

Beyond this coexistence, the modes interact in a dynamic, systemic fashion. This dynamic is driven by a sequence of actions and reactions: the profound success of the Market-Liberal Model in generating dominant

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global platforms motivated the Standards-Exporting Model as a defensive countermeasure. In turn, the EU's regulatory hegemony prompts Sovereignty-First responses from countries seeking to avoid both U.S. corporate dominance and EU regulatory oversight. Subsequently, China's assertive localization policies motivate reciprocal restrictions from other nations concerned about its expanding digital influence, thereby creating cascading fragmentation across the global digital landscape.

A comparative analysis reveals distinct outcomes for each mode, shaped by their primary mechanisms. The Market-Liberal Model, seen in the U.S. and Singapore, leverages network effects and data advantages to achieve persistent services trade surpluses, a outcome reinforced by its ability to attract capital and fuel further innovation. By contrast, the Standards-Exporting Model of the EU relies on regulatory hegemony and compliance barriers, yielding a dual BoP impact through regulatory service exports and market protection, a cycle that strengthens as standard adoption creates perpetual advantages for EU firms. Conversely, the Sovereignty-First Model, implemented with varying success in China, Vietnam, and India, uses market segmentation and forced localization, leading to a dualistic BoP pattern of short-term costs with the potential for long-term domestic champions. Finally, the Regulatory Fragmentation Model, prevalent in Indonesia and parts of Southeast Asia and Africa, is trapped in a cycle of policy uncertainty and underinvestment, guaranteeing persistent services deficits and import dependence.

The CCC framework demonstrates that no single mode is universally optimal; their effectiveness is dependent on a country's initial conditions. The Market-Liberal Model requires sufficient pre-existing domestic capacity to spawn competitive firms before global network effects lock in foreign dominance. The Standards-Exporting Model depends on substantial market size and institutional capacity to make its regulations credible and enforceable beyond its own borders. The Sovereignty-First Model is only viable for countries with large domestic markets, significant state capacity for industrial policy, and complementary innovation systems. In stark contrast, the Regulatory Fragmentation Model is never optimal but is instead a pathology resulting from profound capacity constraints, from which escape typically requires targeted external assistance or deepened regional coordination.

4.Analysis of Implementation Path and Strategy

4.1.Implementation Path

Movement from current fragmented conditions toward functional interoperability cannot occur through immediate comprehensive transformation but must follow a sequential developmental trajectory. Three forms of lock-in—regulatory-institutional, competitive, and geopolitical—render wholesale convergence structurally infeasible in any politically relevant timeframe (O'Hara, 2008). The implementation path must therefore be conceptualized as phased evolution, with each stage creating prerequisites for subsequent advancement. This temporal logic recognizes that certain interventions are premature if attempted before foundational conditions exist, while others become feasible only after structural transitions occur.

4.1.1.Halt The Downward Spiral of Retaliatory Fragmentation

This phase addresses the most acute manifestations of destructive fragmentation: the sovereignty spiral

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among major powers and deteriorating conditions in fragmentation-mode jurisdictions. The path objective is not resolution but stabilization—preventing further degradation while establishing minimal baselines that enable subsequent coordination. The critical path requirement is interrupting self-reinforcing cycles of defensive regulatory responses whereby each major jurisdiction's assertion of control motivates reactions by others, which in turn justify further assertiveness. This requires depoliticizing genuinely technical issues through joint working groups among regulatory powers that separate legitimate security concerns from protectionist motivations.

For fragmentation-mode jurisdictions, the path requirement is halting policy volatility that prevents any investment horizon from forming. Regulatory moratoria—administratively declared pauses on new data governance legislation for defined periods—provide stability necessary for implementation of existing rules and business planning. Simultaneously, emergency capacity-building support must begin flowing to prevent complete institutional collapse in the most-affected jurisdictions. Success in this phase is measured not by achieving agreement on substantive standards but by reducing the velocity of retaliatory regulatory escalation and creating sufficiently stable conditions that actors can contemplate medium-term commitments. Failure manifests as accelerating fragmentation: additional major economies implementing blanket localization, retaliatory measures proliferating, or fragmentation-mode jurisdictions abandoning regulatory efforts entirely.

4.1.2.Build Interoperable Frameworks within Regional Blocs

The medium-term phase shifts from preventing deterioration to actively building institutional infrastructure for managed pluralism. The path objective is reducing dimensional complexity from hundreds of national regimes to a manageable number of regional frameworks with clear interoperability protocols. This phase becomes feasible only after Phase 1 has established sufficient stability that multi-year regional coordination projects are viable. The critical path requirement is completing regional regulatory harmonization within existing economic blocs—ASEAN, AfCFTA, Mercosur, Pacific Alliance, Gulf Cooperation Council (Pasadilla & Duval, 2020). Crucially, this does not mean each region developing unique indigenous frameworks, which would merely relocate fragmentation from national to regional level, but rather each region selecting and wholesale-adopting proven template frameworks with minimal local modification.

Concurrently, this phase requires sustained capability development enabling fragmentation-mode jurisdictions to effectively implement adopted frameworks. Unlike Phase 1's emergency assistance, Phase 2 support is systematic and institutionalized: multi-year training programs for data protection authorities, development of regional compliance certification systems, establishment of shared expertise pools, and creation of regional data governance infrastructure (Pasadilla & Duval, 2020). Success requires matching external support to the five-to-seven-year timeline necessary for building genuine institutional capacity.

The path milestone marking readiness for Phase 3 is functional interoperability within each regional bloc combined with mutual recognition agreements between at least two major regional frameworks. For instance, if ASEAN harmonizes around APEC Cross-Border Privacy Rules, the EU consolidates its existing framework, and AfCFTA adopts GDPR-inspired rules, with mutual recognition established between them, this creates the foundation for global architecture. Phase 2 fails if regional consolidation stalls due to sovereignty resistance or if capability-building proves insufficient for effective implementation.

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4.1.3.Establish a Permanent, Plurilateral Meta-Framework

The long-term phase formalizes managed pluralism that earlier phases have established organically. The path objective is creating permanent governance infrastructure that accepts regulatory diversity as legitimate while preventing it from devolving into destructive fragmentation. This phase requires treaty-level international agreements and institutional innovations that are politically feasible only after regional consolidation has demonstrated coordination benefits and reduced the number of necessary negotiating parties from nearly two hundred countries to perhaps six to eight regional blocs.

The critical path requirement is establishing a plurilateral framework recognizing multiple legitimate regulatory models—rights-based/standards-exporting, market-liberal, sovereignty-conscious—with binding interoperability protocols between them (Jones, 2023; Bodó et al., 2021). This is not a single global standard but a meta-framework governing how different standards interact, analogous to the WTO's recognition of different labor and environmental standards while establishing rules preventing their use as disguised protectionism. The framework would specify minimum transparency requirements, procedural fairness standards, and proportionality tests that all models must meet while allowing substantive variation in privacy protections, data localization requirements, and algorithmic governance approaches.

Institutionally, this phase requires permanent coordinating mechanisms, likely situated within existing international organizations or potentially a new specialized agency, providing binding dispute resolution, ongoing technical standards development, monitoring of mutual recognition commitments, and administration of redistribution mechanisms. The temporal logic recognizes that attempting to establish such institutions prematurely—before regional consolidation has occurred and benefits are demonstrated—produces non-functional bureaucracies lacking political support and implementation capacity.

Meanwhile, Phase 3 must incorporate redistribution mechanisms addressing cumulative advantages and structural Balance of Payments imbalances that earlier phases cannot resolve through coordination alone. The path logic is sequential: redistribution is politically infeasible in Phase 1 when major powers are locked in competitive assertion, becomes conceptually possible in Phase 2 as regional consolidation creates coalitional negotiating power for developing countries, and becomes operationally necessary in Phase 3 to sustain the plurilateral framework by providing tangible benefits to jurisdictions that have accepted interoperability disciplines.

Success in Phase 3 manifests as stable pluralistic equilibrium: data flows relatively freely between jurisdictions with mutual recognition agreements while accepted protocols govern transfers to non-recognized jurisdictions; firms face compliance costs but these are predictable and modular rather than fragmentary; developing countries have viable paths to digital economic development rather than permanent subordination; and Balance of Payments imbalances from digital services are moderated through combination of market access, capability development, and potentially compensatory mechanisms.

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4.2.Strategies

4.2.1.Prioritize Technical Interoperability Over Full Regulatory Harmonization

An important insight from the CCC analysis is that interoperability can substitute for harmonization. Jurisdictions need not adopt identical regulations if their systems can communicate and transfer data with clear translation protocols. The development of technical standards for cross-border data transfers—covering encryption, authentication, audit trails, and consent management—would enable data to flow across jurisdictional boundaries while respecting each jurisdiction's substantive requirements (Coche et al., 2024).

Such standards can be developed through existing multi-stakeholder technical bodies—the Internet Engineering Task Force (IETF), International Organization for Standardization (ISO), and World Wide Web Consortium (W3C)—which operate through consensus-based processes involving governments, industry, and civil society. Critically, technical standards do not require legislative approval; they are adopted voluntarily by implementers and can be referenced in regulations through administrative rulemaking. For instance, the ISO/IEC 27000 series on information security management is widely incorporated into data protection regulations globally without requiring each jurisdiction to legislate its specific provisions.

Investment in privacy-enhancing technologies (PETs) provides a complementary mechanism. Technologies such as federated learning, homomorphic encryption, secure multi-party computation, and differential privacy enable data analysis and AI training without requiring raw data to cross borders, technically satisfying localization requirements while preserving analytical capability (Bodó et al., 2021). Governments and international organizations can accelerate PET adoption through funded research initiatives, procurement preferences, and regulatory safe harbors that provide certainty that PET-processed data meets localization or protection requirements.

4.2.2.Build Interoperability Through Expanding Mutual Recognition Agreements

While comprehensive global harmonization is infeasible, bilateral and plurilateral mutual recognition agreements can create functional interoperability between compatible regulatory regimes. The EU adequacy decision mechanism, whereby the European Commission determines that a third country provides essentially equivalent data protection, enables unrestricted data flows without requiring identical regulations (Jones, 2023). Expanding such networks—through reciprocal adequacy decisions, APEC CBPR certifications, and bilateral treaties—can create a patchwork of frameworks that substantially reduce compliance fragmentation.

Implementation of mutual recognition frameworks typically occurs through executive agreements and administrative determinations rather than legislation. In most jurisdictions, foreign affairs and trade ministries possess delegated authority to negotiate and implement international agreements on technical regulatory matters. The European Commission's adequacy decisions, for instance, are executive acts (though subject to judicial review), and similar administrative mechanisms exist in most jurisdictions.

A strategic priority should be establishing adequacy frameworks between regional regulatory leaders—specifically, EU-Brazil-Japan-South Korea coordination in the standards-exporting mode, and U.S.-Singapore-Chile-Australia coordination in the market-liberal mode. These networks would create de facto global

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standards that smaller jurisdictions could join by demonstrating equivalence to one of the recognized frameworks, reducing the need for bilateral negotiations with every trading partner.

4.2.3.Reduce Regulatory Uncertainty Through Advance Rulings and Dispute Resolution Mechanisms

Regulatory uncertainty—the core problem in fragmentated jurisdictions and present across all modes—can be partially mitigated through enhanced transparency and predictable dispute resolution. Currently, firms facing regulatory conflicts or unclear requirements have limited recourse beyond litigation or quiet non-compliance. Establishing accessible mechanisms for regulatory clarification, pre-clearance of cross-border data transfer arrangements, and binding dispute resolution would reduce uncertainty costs substantially (Pasadilla & Duval, 2020).

Many jurisdictions already possess administrative law frameworks that could be extended to provide such mechanisms. Advance ruling systems, common in customs and tax administration, allow firms to request binding determinations on how regulations apply to specific fact patterns before undertaking risky investments. Extending this model to data governance—whereby firms can request advance rulings on whether proposed data transfers or processing activities comply with local requirements—would reduce uncertainty without changing substantive rules.

Similarly, incorporating data governance disputes into existing international arbitration frameworks—such as ICSID (International Centre for Settlement of Investment Disputes) or arbitration provisions in trade agreements—provides enforceable dispute resolution without requiring new institutions. Recent trade agreements, including USMCA and CPTPP, incorporate provisions allowing investor-state dispute settlement for digital trade issues, though their scope remains limited (Pasadilla & Duval, 2020).

4.2.4.Address Capacity Deficits Through Coordinated, Implementation-Focused Support

The analysis demonstrates that the regulatory fragmentation mode is fundamentally a capacity problem rather than a policy choice problem. Addressing it requires sustained, coordinated capacity-building support that individual fragmentation-mode jurisdictions cannot self-provide. Multi-stakeholder capacity development consortia—involving international organizations, bilateral donors, industry associations, and academic institutions—can provide the institutional, technical, and human resource support necessary to escape the fragmentation trap.

Such consortia can be organized regionally (e.g., ASEAN Digital Capacity Initiative, African Digital Governance Facility) and funded through pooled contributions from development finance institutions, technology industry corporate social responsibility budgets, and bilateral aid programs. Critically, effective capacity development must be implementation-focused rather than policy-formulation-focused: the priority is training regulators in enforcement, building technical audit capabilities, developing model contract libraries and compliance tools, and creating accessible guidance for local firms—not producing additional strategic documents.

The World Bank's Digital Development Partnership and ITU's capacity-building programs provide existing institutional platforms that could be substantially expanded and refocused toward implementation capacity. Donor coordination through OECD DAC (Development Assistance Committee) could ensure that capacity-building assistance is coherent rather than duplicative and addresses genuine implementation bottlenecks

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rather than donor priorities.

5.Conclusion

5.1.Regulatory Divergence Is a Structural Outcome

Regulatory divergence in data flows is a structural outcome of feedback loops, not a correctable policy error. Jurisdictions' regulatory choices are rational responses to their positions in the digital economy, shaped by initial asymmetries in technology, infrastructure, and institutions (Bodó et al., 2021; Jones, 2023). The U.S. market-liberal approach leverages its first-mover advantage; the EU's standards-exporting model reflects its regulatory power; China's sovereignty-first framework serves national security and industrial policy; and developing countries' fragmentation stems from capacity constraints (Duan, 2025; Jin & Pan, 2025).

These asymmetries trigger cycles that deepen over time. Each regulatory approach reinforces its starting position: market-liberal policies amplify platform dominance; standards-exporting creates compliance ecosystems favoring early adopters; sovereignty-first protections can enable domestic champions but risk technological isolation. This path dependency means that calls for "harmonization" misdiagnose the problem. Jurisdictions are not failing to coordinate; they are locked into different equilibria reflecting distinct values. Solutions must acknowledge this heterogeneity.

5.2.Different Regulatory Models Produce Distinct and Self-Reinforcing Balance of Payments Outcomes

Different regulatory approaches generate distinct BoP outcomes. The market-liberal mode produces growing services trade surpluses for jurisdictions with dominant platforms, driven by network effects and data accumulation (Schwartz, 2019).

The standards-exporting mode has dual effects. Jurisdictions like the EU import platform services but offset this by exporting regulatory services (compliance, certification) and creating barriers to new entrants (Jones, 2023; Kersan-Škabić, 2021). This model redistributes, rather than eliminates, services deficits.

The sovereignty-first mode has contingent outcomes. Large economies like China can leverage protected markets to incubate exporters, turning initial costs into long-term gains (Duan, 2025). Smaller economies attempting this often face efficiency losses and ongoing BoP pressures (Jin & Pan, 2025).

The regulatory fragmentation mode guarantees services trade deficits. Policy volatility prevents the scale needed for competitive digital exports, locking jurisdictions into being net consumers of foreign platforms and software (Pasadilla & Duval, 2020). These differential outcomes show that current BoP patterns are self-reinforcing structures that concentrate gains in early-mover jurisdictions.

5.3.Global Harmonization Is Infeasible, Making Managed Pluralism the Only Viable Path Forward

Path dependency makes global regulatory harmonization infeasible, leaving "managed pluralism" as the only viable approach. Three forms of lock-in prevent convergence:

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1.Regulatory-institutional lock-in: Existing bureaucracies, legal precedents, and compliance infrastructures are too embedded to abandon without significant cost (O'Hara, 2008).

2.Competitive lock-in: Liberalization by late-movers would likely accelerate market consolidation by existing dominant firms, not create new domestic competitors (Fletcher, 2023).

3.Geopolitical lock-in: Assertions of regulatory control motivate defensive responses, creating a fragmentation spiral (Coche et al., 2024).

Therefore, governance should pursue functional interoperability within this diversity, not uniformity. This architecture must be actively managed through mechanisms like technical standards, mutual recognition agreements, and dispute resolution. The goal is to enable cross-border digital trade despite regulatory differences, minimizing friction while respecting heterogeneity.

5.4.Progress Depends on Executive and Administrative Action

Effective interventions require executive and administrative action, not comprehensive legislative reform. Because legislatures are unlikely to enact major regulatory reversals, progress depends on instruments that agencies can deploy.

Many interventions fall within existing administrative authority. Agencies can issue guidance for tiered compliance, establish certification for SMEs, and negotiate mutual recognition agreements (Jones, 2023). They can shift from blanket to risk-calibrated data localization through rulemaking and pursue plurilateral agreements through executive trade powers (Hammad et al., 2021; Jin & Pan, 2025).

This administrative path is politically feasible and allows for iterative adjustment. However, its actions are more vulnerable to reversal than legislation. Given the infeasibility of legislative harmonization, administrative action is the most viable path for near-term progress.

5.5.Technical Interoperability Is Insufficient Without Redistributive Mechanisms to Address Structural Imbalances

Technical solutions for interoperability are insufficient. Addressing structural BoP imbalances requires redistributive mechanisms to counteract cumulative advantages and help "capability-trapped" jurisdictions. The CCC framework shows that early-mover advantages are self-reinforcing. Without interventions, these processes will continue to concentrate gains and perpetuate deficits.

For jurisdictions in fragmentation mode, domestic policy reform alone is not enough. External capacity-building is necessary: technical support for regulatory implementation, training for agencies, and resource transfers for institutional development (Jin & Pan, 2025; Pasadilla & Duval, 2020).

For others, addressing exploitation requires mechanisms that provide local value capture, such as preferential market access, technology transfer commitments, or revenue-sharing frameworks. While challenging to implement, failing to address these distributional concerns will perpetuate the sovereignty spiral. Redistribution must target capability development—investments in education, R&D, and innovation ecosystems—not just compensation (Gong & Binz, 2023).

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The political feasibility of these mechanisms is uncertain. However, the analysis suggests that without redistribution, the system will generate widening divergence and intensifying fragmentation. From this perspective, redistribution is not altruism but self-interest, as it reduces motivations for destructive localization and expands markets.

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