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1. Governing science and technology in the era of megaregionals

Shin-yi Peng, Han-Wei Liu, and Ching-Fu Lin

I. INTRODUCTION

We live in one of the golden ages of scientific and technological advances. Neoliberalism in the post-World War II era has geared up the pace of globalization.¹ Under the banner of deregulation and privatization, globalization has contributed to a set of economically driven rules and processes under the auspices of the World Trade Organization (WTO). The goal of globalization is to increase market efficiency by minimizing political interference. This ideology is evidenced by the important proxies (e.g., nondiscrimination, necessity test, international standard, and scientific evidence) embedded in the WTO that address behind-the-border measures and their ramifications.

Taken together, the neoliberal governance has facilitated cross-border movements of capital, people, and trade, fueling breakthroughs in fields such as information and communications technology (ICT), genetic engineering and bioscience, and renewable energy and environmental mechanics. On the one hand, such innovations have contributed significantly to individual lives and society, as their application has increased productivity and efficiency. On the other hand, new technologies have posed potential risks to safety, health, and the environment.² Characterized by its very nature—complex, uncertain, and constantly evolving—technological innovation is challenging for any regulator to keep up with. In an interdependent world, such challenges go beyond geographic boundaries and call for rigorous transnational

¹ See e.g., Stephen Gill, *Globalisation, Market Civilisation, and Disciplinary Neoliberalism*, 24 MILLENNIUM J. INT'L STUD. 399 (1995); Elaine Hartwick and Richard Peet, *Neoliberalism and Nature: The Case of the WTO*, 590 ANNALS AM. ACAD. POL. & SOC. SCI. 188 (2003).

² See JACQUELINE PEEL, *SCIENCE AND RISK REGULATION IN INTERNATIONAL LAW* (Cambridge University Press, 2013).

coordination, yet regulatory cooperation can be equally, if not more, problematic.³

The diversity of regulatory approaches reflects different cultural, economic, social, and political underpinnings. In addition, harnessing new technologies can deter or promote specific segments of an industry, which not only matters for market competition, but for a nation's prosperity and long-term development. Regulatory interventions have emerged as a mixture of public interests and national economic and political strategies. Time and again, the jurisprudence of, and many specific trade concerns raised before, the WTO have underscored the difficulty of drawing a clear-cut distinction between disguised protectionism and legitimate protection of public goods.⁴ To complicate the matter, governments have initiated diverse, and sometimes conflicting, regulatory responses to limit those ramifications, exacerbating tensions between international cooperation and regulatory autonomy, and undermining the multilateral framework.

II. INTERNATIONAL ECONOMIC ORDER: IMPLICATIONS OF MEGAREGIONALS

Governments around the globe have thus been compelled to reconfigure the default rules and locate an optimal institutional design for concerted actions. While the WTO has been struggling to keep pace with the scientific and technological developments and the resulting ramifications, several governance models have emerged as possible alternatives to multilateralism. The Trans-Pacific Partnership (TPP)—rebranded as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) after the United States' withdrawal and subsequent renegotiations among the other eleven parties—lays down a set of ground-rules for present and even future challenges. In the ICT sector, the TPP/CPTPP addresses not only topical issues in the online setting, such as cross-border

³ See e.g., MARA BURRI AND THOMAS COTTIER (EDS.), *TRADE GOVERNANCE IN THE DIGITAL AGE* (Cambridge University Press, 2012); ANNETTE KUR AND MARIANNE LEVIN (EDS.), *INTELLECTUAL PROPERTY RIGHTS IN A FAIR WORLD TRADE SYSTEM* (Edward Elgar Publishing, 2011); BRYAN MERCURIO AND KUEI-JUNG NI (EDS.), *SCIENCE AND TECHNOLOGY IN INTERNATIONAL ECONOMIC LAW: BALANCING COMPETING INTERESTS* (Routledge, 2014); YULIA SELIVANOVA (EDS.), *REGULATION OF ENERGY IN INTERNATIONAL TRADE LAW: WTO, NAFTA AND ENERGY CHARTER* (Wolters Kluwer, 2011).

⁴ See MEREDITH KOLSKY LEWIS AND SUSY FRANKEL (EDS.), *INTERNATIONAL ECONOMIC LAW AND NATIONAL AUTONOMY* (Cambridge University Press, 2010).

data flows and data localization, source code, and anti-spam, but the ICT standard-setting process, a source of controversy in the offline world. The TPP/CPTPP's new institutional designs include extending intellectual property rights (IPRs) holders' rights by introducing patent linkage, incorporating SPS-Plus arrangements to strengthen the importance of scientific evidence in setting public health and food safety measures, and setting forth cross-cutting rules to promote renewable energy, environmental protection policy, and sustainable trade. Despite the United States' withdrawal, these gold standards enshrined in the TPP/CPTPP may find their way through other channels and continue to exert considerable influence in current and future negotiations.⁵ Beyond the TPP/CPTPP, the Transatlantic Trade and Investment Partnership (TTIP) and the Regional Comprehensive Economic Partnership (RCEP), two other pillars of megaregionalism, promise to respond to those governance challenges in one way or another.

As promising as these megaregional initiatives may look, there has been no empirical evidence of their efficacy as regulatory uncertainty remains omnipresent. An immediate hurdle is the political climate on both sides of the Atlantic, which makes it problematic to conclude, ratify, and implement these new rules.⁶ Moreover, addressing these issues through different trading blocs in a piecemeal fashion may fail to stand as a valid alternative to multilateralism.⁷ What has been proposed are noteworthy efforts by the United States, the European Union, and China behind these megaregional blocs to manage ramifications. All these issues cast doubt on the

⁵ See e.g., Valerie Volcovici, *Trump Adviser: TPP 'Dead', Will Move Quickly on Bilateral Trade Deals*, REUTERS (January 13, 2017), available at www.reuters.com/article/us-usa-trump-trade-adviser-idUSKBN14X1X8 (last visited 21 August 2017); Alex Capri, *The TPP Moves Forward without Trump's America*, FORBES (22 May 2017), available at www.forbes.com/sites/alexcapri/2017/05/22/the-tpp-moves-forward-without-trumps-america/#668bfd234fed (last visited 21 August 2017).

⁶ See e.g., Sean O'Grady, *By Scrapping TPP and TTIP, Trump has Boosted American Jobs in the Short Term—and Destroyed them in the Long Term*, INDEPENDENT (24 January 2017), available at www.independent.co.uk/voices/donald-trump-trade-deals-tpp-ttip-american-business-workers-boost-short-term-destroy-long-term-a7543706.html (last visited 21 August 2017); *Europe Gets Ready for Donald Trump*, THE ECONOMIST (19 January 2017), available at www.economist.com/news/europe/21714998-next-american-president-seems-view-eu-indifference-or-contempt-europe-gets-ready (last visited 21 August 2017).

⁷ See e.g., Cédric Dupont, *ASEAN+, RCEP and TPP: A Clash of Integration Concepts*, in *THE FUTURE OF THE WORLD TRADING SYSTEM: ASIAN PERSPECTIVES* 109 (Richard Baldwin et al. eds., 2013); Chad P. Brown, *Mega-Regional Trade Agreements and the Future of the WTO*, 8(1) GLOBAL POL'Y 107 (2017).

megaregional governance model and its prospects for forging regulatory convergence among governments.

Such a sea change and emerging challenges lead us to ask the following analytical questions. First, what, if any, are the scientific and technological advancements that have triggered, or are likely to trigger government interference, a new battleground in the international economic law community? Second, in what way have (or will) regulators step in? Do countries have different solutions to the same problem, and if so, why? What are the rationales for regulatory intervention? What are their implications for international economic order? Third, how can the WTO framework accommodate such challenges? This raises a more crucial issue: what mechanisms, if any, will the multilateral, plurilateral, or bilateral economic integration arrangements design to address the resulting ramifications? Will the emerging megaregional agreements help promote regulatory cooperation/coherence? If so, how? This phenomenon has raised more questions than it has answered in terms of regulatory divergence.

III. REGULATORY DIVERGENCE AND CONVERGENCE: THE ARGUMENT IN BRIEF

International economic law (IEL) and technology interact when trade rules encourage or interfere with the development of technology. IEL and technology also interact when international society decides that technology produces undesirable results and must use global norms to modify those results. This book reflects the editors' understanding of the interplay between IEL and technology, and how that interplay can be improved. The chapters of this volume offer a framework for deeper forays into the issues raised in this chapter. The contributions featured here are organized into five Parts and sixteen chapters, covering the most critical challenges: trade in ICT goods and services, environmental and energy policy, food safety and public health, and intellectual property rights.

In Chapter 2, Petros Mavroidis reminds us of the role of the WTO in managing international trade relations. By outlining the changing landscape of non-tariff barriers (NTBs) and trade liberalization through the lens of the global value chains (GVCs), Mavroidis draws our attention to 'New WTO Think': an integration strategy rooted in the General Agreement on Tariffs and Trade (GATT) premise but is more inclusive of regulators and non-state actors and more flexible and positive. Mavroidis calls upon governments to maintain the policy-relevance of the WTO by embracing the confluence of shared social preferences and trade as a motivation for advancing international regulatory cooperation.

Part II focuses on emerging challenges facing trade policy-makers in the ICT industry. In Chapter 3, Rolf Weber takes up the nexus between cross-border data flows and digital trade from a European perspective. By examining recent developments along the lines of the Digital Single Market Strategy for Europe and the General Data Protection Regulation (GDPR), Weber underscores the challenges and opportunities facing the European Union policy-makers while negotiating new disciplines under the aegis of the Trade in Services Agreement (TiSA), TTIP, and Comprehensive Economic and Trade Agreement (CETA). Using unsolicited commercial electronic messages as a case study, in Chapter 4, Shin-yi Peng points out the limits of regulatory coherence under Chapter 25 of the TPP/CPTPP to address recurring problems in the context of electronic commerce. As Peng remarks, while, in theory, regulatory coherence seems a promising way to reconcile divergent regulatory approaches, its efficacy would rest upon how governments read and apply it. Chapter 5, by Mark Wu, explains how governments leverage export policies, technology controls, and investment reviews to shape the market competition for the technology-related GVCs. Wu offers a nuanced appraisal of the development of new disciplines on the use of these strategic instruments amid the trend of megaregionalism and underscores the role of the US-Sino relationship. In Chapter 6, Han-Wei Liu picks up another interesting yet less explored issue in the digital trade literature by offering a detailed account of China's indigenous standards and innovation policy in the ICT industry and their implications for trade. While many see China's 'techno-nationalism' as a credible threat to the global trading system, Liu argues that techno-nationalism may be less serious than it appears because of the internal and external constraints that may place limits on home-grown initiatives in megaregionalism.

Part III studies the importance of environmental governance and renewable energy promotion in megaregional trade negotiations. In Chapter 7, Won-Mog Choi deciphers the relationship between trade and biodiversity in addition to the philosophical tension between Bretton Woods trade liberalism and the New International Economic Order. Building upon an analysis of relevant TPP/CPTPP texts, Choi discusses how countries may promote sustainable use of biological diversity and respect knowledge and practices of indigenous and local communities relating to sustainable use of biodiversity. He suggests that the TPP/CPTPP has taken a mega-step for the prevention of global clashes between trade and environment regimes toward mutually reinforcing governance in the twenty-first century. In Chapter 8, Sherzod Shadikhodjaev points out that the ongoing talks on the Environmental Goods Agreement that focus on tariff removal (reduction) are unlikely to cover regulatory issues of renewable energy.

He notes that some megaregional agreements, such as the TPP/CPTPP and TTIP, incorporate (or will incorporate) specific provisions dedicated to issues of renewable energy regulation. Shadikhodjaev examines multilateral and regional trade rules with reference to localization measures, government support, infrastructural facilities, technical standards, and services, and suggests adopting a more renewables-oriented regulatory approach. In Chapter 9, Ming-Zhi Gao evaluates the potential implications of promoting renewable electricity technology in megaregional agreements for regulatory convergence and divergence. Gao analyzes the dynamic interactions between the regimes of international economic law and international climate/environmental law, and explores possible ways to strike a balance.

Part IV turns to food safety and public health, one of the most controversial areas of scholarly attention due to its multifaceted normative implications. In Chapter 10, Yoshiko Naiki analyzes food and product safety issues in the TPP/CPTPP, and examines whether its rules require countries to relax their criteria in their national laws, standards, or labeling requirements. Naiki highlights the TPP/CPTPP's unique practice of including product-specific provisions relating to genetically modified organisms (GMOs), used and remanufactured goods, motor vehicles, cosmetics, organic products, and food additives, and argues that it reflects the trade interests and concerns of individual exporting parties. She concludes that such provisions do not have a substantial impact on national safety standards, but may promote cooperation, the exchange of information, and transparency of national measures. In Chapter 11, Ching-Fu Lin uses the TPP/CPTPP sanitary and phytosanitary (SPS) Chapter as a vantage point for exploring the transformation of food safety governance in the era of megaregionals. By referencing the WTO SPS Agreement and other essential legal instruments, Lin carefully articulates the normative meanings of the SPS-Plus institutional designs, and discusses their interactions with cross-cutting regulatory coherence requirements, and more broadly, the multilateral trading system. He argues that the SPS-Plus designs in the TPP/CPTPP SPS Chapter, which incorporates a few regulatory practices of the United States, a strengthened dispute prevention and settlement mechanism, and more importantly, a multilateral anchor tied to the WTO regime, may transform the way food safety issues are governed in the future. Chapter 12, written by Chang-fa Lo, takes up the challenge of packaging-related food safety issues and offers a detailed analysis on whether they have been properly addressed in the recent megaregional agreements. According to Lo, when comparing the SPS and TBT Agreements under the WTO, the TPP/CPTPP does not offer much progress with respect to the protection of food safety. He therefore offers

an interpretative view to avoid the result of interpretations of the SPS and TBT provisions becoming absurd.

Part V considers IPRs, an overarching issue that affects almost every scientific and technological activity. Chapter 13, by Peter Yu, offers a high-level overview of the most recent developments of IPR-related disciplines in the age of megaregionalism. By considering other norm-setting initiatives, including the TPP/CPTPP, Yu evaluates whether the proposed RCEP norms would lead to more regulatory convergence, divergence, or what commentators have now advanced as 'crossvergence', while identifying issues that domestic policy-makers and international negotiators should consider in reconfiguring their future norms. Branislav Hazucha, in Chapter 14, engages in a similar pursuit by revisiting the trend of harmonization of IPRs. Built upon his studies of the practices of regional trade agreements, he clearly illustrates, despite the increased harmonization, a considerable divergence in the application of international standards of IPR protection amongst countries. In Chapter 15, Bryan Mercurio addresses the linkage between patent, public health, and international trade by exploring the purpose and effect of the common pharmaceutical patent law provisions in recent free trade agreements. While harmonization of patent laws would yield benefits and efficiency, Mercurio's analysis underscores its undesired consequences in terms of pharmaceutical patents. He suggests that any normative standards should be tailored to the context of the country at issue; the harmonization of practical standards could reduce costs and increase efficiency in the public health system. Chapter 16, by Shujie Feng, concludes Part V by focusing on the interaction between IPRs and fair competition. Using high-profile cases in Mainland China as examples, Feng describes the concerns about unfair competition that emerge from the way in which some leading high-tech companies in China leverage their technologies to attract consumers in the online environment. Feng offers a thorough analysis of the role of international and regional agreements in addressing unfair competition and indicates the possible convergence and its limits by taking into account the variations in local contexts.

IV. GOVERNING SCIENCE AND TECHNOLOGY: TODAY AND TOMORROW

Working in the field of international economic law, we were naturally interested in questions about megaregionals. We took notice of the proliferation of research on global governance in science and technology. We believe that it would be useful for scholars and practitioners in IEL

to have a book that explores different aspects of regulatory convergence between international trade and technological development, that reflects theoretical diversity, and thereby contributes to the organically evolving norms regarding the global governance of science and technology. This scholarly endeavor brings together contributions from experts who reflect upon and approach these intellectual and practical inquiries in an exceptionally informed, insightful, and invigorating fashion. We hope that the contributions in this edited collection offer responses to the new challenges in specific fields, sectors, or industries.

To conclude, this book identifies key areas that have been theoretically and practically demonstrated as carrying the most significance for generations to come: digital trade, climate change and environment, food safety and public health, and IPRs. In terms of digital trade, this collection picks up what others have left out by addressing the timeliest issues: data localization and cross-border information flow, anti-spam, and the Sino-US laws and politics in addressing ICT-related trade and investment conflicts. On climate change and environment, the Paris Agreement is a promising milestone in multilateral efforts to address global climate change and environmental justice, yet how its bottom-up approach based on state pledges will play out remains to be seen. Emerging technologies such as carbon removal and solar geoengineering initiatives and their interactions with the megaregional trading systems merit a serious survey of normative implications. In addition, food safety and public health are among the most controversial areas of scholarly attention, as their regulatory consequences are not limited to trade or public health. Rather, the interactions between megaregional regimes, national regulatory sovereignty (with vastly diverse political, social, cultural, and ideological underpinnings), and the background rules under the WTO pose crucial inquiries to configuring and reconfiguring global trade governance. Finally, our attention turns to IPRs by placing an old debate in a new context, discussing how megaregionals approach and harmonize IPR rules while taking into account public health, local values, and market competition. While these issues are valid in their own right, concentrating on them risks losing sight of the whole picture. This leads us to revisit the implications of the overarching notions of regulatory coherence and cooperation, and more crucially, the relevance of the decade-long WTO negotiations, which have the potential to forge a common governance infrastructure to promote regulatory harmonization and consistency among diverse institutions, processes, and interests.

In short, given the rapidly evolving landscape of digital technology, e-commerce, climate change, as well as food safety and public health, how best to govern their ramifications has become a daunting task for

both practitioners and academics. While the rising megaregional agreements have taken on these challenges innovatively, their approaches involve uncertainty and fragmentation that may present obstacles rather than solutions. None of these issues, however, have been adequately addressed. Previous attempts to produce surveys of this kind are outdated. Therefore, this is a good time to map out the new dynamic challenges posed by scientific and technological advances and corresponding regulatory approaches, and capture, more broadly, the emerging contour of global trade governance in the age of megaregionals. This volume would therefore be a valuable research reference and a useful text for courses on, for instance, international economic law, technology law, political science, political economy, administrative law, international business, and global governance.

Taken as a whole, the viewpoints in this volume reflect the status of regulatory response to technological innovations at this unsettling time. The chapters may only begin to answer these questions while identifying the direction of evolving norms. This reality explains the book's subtitle. Some of these propositions leave crucial questions unanswered, especially from the viewpoint of a sectoral policy-maker struggling to respond to IEL development while sensibly balancing regulatory objectives. Nonetheless, covering all the issues related to science and technology governance in the mega-regional era with comprehensiveness is impossible. Should we have addressed the problems of nanotechnologies? Or should we have prioritized the debates over emerging threats of robots and artificial intelligence (AI)? Should we have continued to add to the voluminous literature on megaregional trade agreements in Trump's world? Likewise, there is an avalanche of writing on China-led regional initiatives. Choices had to be made and we tended to venture into areas which are important but have to date been underexplored. Having said that, this book represents not only a valuable and necessary addition to the literature but also a point of departure that invites further research, exploring the way to rise to the challenges ahead.