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Arthur Daemmrich, *Epistemic Contests and Legitimacy of the World Trade Organization: The Brazil – USA Cotton Dispute and Incremental Balancing of Global Interests*
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EPISTEMIC CONTESTS AND LEGITIMACY OF THE WORLD
TRADE ORGANIZATION: THE BRAZIL – USA COTTON
DISPUTE AND INCREMENTAL BALANCING OF GLOBAL
INTERESTS

ARTHUR DAEMMRICH*

The World Trade Organization [WTO] features prominently in studies of international institutions, often cast either as a tool of rich-world domination over the poorer South or as a neutral mediator facilitating a tariff-free world of economic prosperity. This article instead analyses how the WTO has sought legitimacy for itself and for the underlying institution of free trade in the midst of questions regarding its organizational mandate and management of international trade negotiations. Historically, legitimacy for GATT and later the WTO was understood to derive from expanding membership and success at major trade round negotiations. In the past decade, and despite a lack of progress in the Doha Round, legitimacy has been built through institutional deepening by means of dispute resolution processes. This shift, I argue, raises epistemic questions of expertise, the relationship of models to real-world outcomes, and methods for bounding disputes over scientific facts. Based on a case study of the Brazil – Upland Cotton dispute and a trend analysis of over 400 total WTO disputes, I find that the WTO dispute settlement process is helping to legitimize the institution of free trade through its public display of rational authority and neutral expertise. At the same time, dispute panels have begun to pass judgment on issues of econometric and scientific uncertainty. As a result, the basis for the broader legitimacy of the WTO is shifting from questions of representation that have long drawn attention to epistemic issues, especially concerning the design of

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international trade models. The article thus provides insights on the resolution of disputes in global trade while contributing to our understanding of the evolving role of modelling at international organizations.

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I. INTRODUCTION

Epistemic contests featuring competing models of reality and the nature of knowledge are on the rise. In areas as diverse as trade disputes, climate change negotiations and the regulation of embryonic stem cell therapies, governments, industries and social movements dispute the factual findings along with the underlying models and methods on which they are based.¹ While they typically manifest in controversies over specific claims, for example, how producers respond to government subsidies or whether genetically modified crops pose health risks, epistemic contests ultimately involve debates over which of two or more approaches to knowing is most valid, and therefore, represents the most promising path to a policy decision.² The solution seems obvious: agree on a

¹ SHEILA JASANOFF, *DESIGNS ON NATURE: SCIENCE AND DEMOCRACY IN EUROPE AND THE UNITED STATES 192-202* (Princeton Univ. Press 2005) [hereinafter JASANOFF]; Clark A. Miller, *Epistemic Constitutionalism in International Governance: The Case of Climate Change*, in *FOREIGN POLICY CHALLENGES IN THE 21ST CENTURY* 141 (M. Heazle et al. eds., 2009); James K. Sebenius, *Challenging Conventional Explanations of International Cooperation: Negotiation Analysis and the Case of Epistemic Communities*, 46 *INT'L ORG.* 323 (1992); Steve Yearley, *Sociology and Climate Change after Kyoto*, 57 *CURRENT SOC.* 389 (2009).

² Christophe Bonneuil & Les Levidow, *How does the World Trade Organization know? The Mobilization and Staging of Expertise in the GMO Trade Dispute*, 42 *SOC. STUD. SCI.* 75 (2012);

method, run laboratory or field experiments, and then adopt policy reforms. Yet, in many significant areas of contemporary international policy, consensus on underlying methods for determining scientific or economic truth is proving impossible to achieve. Parties to disputes each bring their own facts and framings, thus stymying the possibility of an agreement. While prospects for global agreements may seem hopeless in light of the use of uncertainty in scientific knowledge by opposing camps and the entrenched interests of industries and governments worldwide, in a few areas significant progress has been made toward dispute closure. This article analyses the Dispute Settlement Body (DSB) of the World Trade Organization [WTO] as an example of an organization with the capacity to overcome the stasis that otherwise accompanies epistemic contests.

Almost immediately after their launch in 2001, the Doha Round of WTO negotiations entered a prolonged stalemate.³ A North – South divide emerged regarding agricultural subsidies, enforcement of intellectual property rights, and other so-called “non-tariff” topics of concern to governments worldwide. Notable among these are government procurement, international capital flows into or out of equity markets, and environmental and health regulations. Prevailing economic models that linked enforcement of intellectual property rights and neo-liberal market reforms to sustainable economic growth came under attack. Walkouts from negotiating sessions and heated rhetoric concerning the very purpose of free trade talks took centre stage. After years of expanding participation and broadening the WTO’s mandate, participating countries became deadlocked. As the stalemate continued into the early 2010s, bilateral and regional trade agreements increased in number, fewer countries joined the WTO, and the WTO’s legitimacy as the premier negotiating forum for international trade issues came under question.

In the same period, however, dispute resolution proceedings at the WTO grew considerably. International trade disputes involve the WTO in the adjudication of complex competing claims, typically backed by divergent econometric models and conflicting scientific and market data. Through an analysis of over 400 disputes to date, I find that in the first five years after founding of the WTO, developed countries brought the majority of claims against both other developed and developing countries whereas, by the latter half of the 2000s disputes were on a more even footing. Of special importance as precedents are claims that were brought with success by developing countries against agricultural and other subsidies in the United States and European Union. As member countries began to adhere to WTO rulings, a positive feedback loop was established in which

Anne Ingeborg Myhr, *The Challenge of Scientific Uncertainty and Disunity in Risk Assessment and Management of GM Crops*, 19 ENVTL. VALUES 7 (2010).

³ For a recent discussion of the Doha Round, see Petros C. Mavroidis, *Doha, Dohalf or Dohaha? The WTO Licks its Wounds*, 3 TRADE L. & DEV. 367 (2011).

countries ranging from rich to poor accepted the authority of the WTO as a governing body. Thus, even as negotiations in the Doha Round stagnated, the WTO increased its role as the principal adjudicator of international trade disputes. In the process, the DSB began to establish precedents for the role of expert knowledge and started to rule on the validity of competing scientific and econometric models. Thus, even as thorny questions of North – South representation and balance among competing interests drew the attention of policymakers who understood them as vital to the WTO’s future and to the institutional legitimacy of the international trading system, novel issues of expertise arose alongside the WTO’s emergent juridical role.

This article contributes to scholarship of the WTO, and by implication to the study of other novel international governance bodies, through a focus on the institutional basis for legitimacy and an analysis of epistemic contests that arise during trade disputes. The next section summarizes and builds upon scholarship into legitimacy and expertise from the academic fields of political economy and science and technology studies [STS]. In the third section, data tracking WTO membership and a trend analysis of 424 disputes initiated since 1995 are presented to develop the argument that the basis for legitimacy shifted in recent years from membership growth and associated network effects to dispute settlement.⁴ The significance of expertise to trade disputes, and the resulting potential for epistemic contests, is next analyzed through a case study of the lengthy *Brazil – Upland Cotton* dispute. The conclusion draws the analysis together with reflections on institutional legitimacy and expertise in the contemporary era of globalization. The analysis of the WTO developed here is crucial, I suggest, to understanding international institutions and ongoing developments in globalization writ large.

II. DILEMMAS OF LEGITIMACY AND EXPERTISE

While critics of the WTO use the term “legitimacy” (or frequently, “illegitimacy”) when objecting to the economic shifts that have accompanied the lowering of trade barriers, I use the term here as an analytical concept aligned to scholarship in political science and STS. Specifically, legitimacy has been used to explain collective obedience to laws, rules, and edicts in the absence of omnipotent coercive power. However, extrapolating from the citizenry of a country obeying its leaders to countries ceding power to international institutions has posed conceptual challenges for scholars, alongside the practical challenges confronted by

⁴ For more on network effects and international trade, see Peter Swann, *International Standards and Trade: A Review of the Empirical Literature* (OECD Trade Policy, Working Papers, Paper No. 97, 2010), available at: <http://www.oecd.org/dataoecd/62/59/45500791.pdf>; Luca De Benedictis & Lucia Tajoli, *The World Trade Network*, 34 *WORLD ECON.* 1417 (2011).

organizations like the WTO. This article holds that a next step in the study of institutional legitimacy will come from perspectives developed in STS, notably, the study of dilemmas inherent to expertise in democratic systems and epistemic disputes that arise during scientific controversies.

A. *Legitimacy and Governance*

In political science, legitimacy has been used to understand the emergence of stable modern democracies, to compare institutional variation between nation-states, and more recently, to assess the success or failure of global governance bodies.⁵ Conceptually, legitimacy has a long history, dating at a minimum to John Locke's emphasis on the importance of "consent by the governed" to the formation and stability of government.⁶ Studying democratic governance broadly, and the emerging United States specifically, Alexis de Tocqueville drew attention to the specific notion of legitimacy in the 1840s. Commenting on Americans, he observed, "from Maine to Florida, from Missouri to the Atlantic Ocean, they believe that the origin of all legitimate powers is in the people".⁷ Max Weber's study of political and social structures in the early 20th century advanced a typology of legitimacy across different institutions and over time, specifically under traditional, charismatic, or rational-legal authority.⁸ Depending on the model of governance, legitimacy of rules by which a society functioned were either pre-ordained, upheld through a single powerful leader, or written and revised through defined procedures. Drawing on this lineage, the political scientist Seymour Lipset in the late 1950s defined legitimacy as "the capacity of a political system to engender the belief that existing political institutions are the most appropriate or proper ones for the society". Of lasting importance to the analysis of political systems, Lipset added, "the determination of when new social groups shall obtain access to the political process affects the legitimacy of the political system".⁹

⁵ Michael Zürn, *Democratic Governance Beyond the Nation-State: The EU and other International Institutions*, 6 EUR. J. INT'L REL. 183 (2000); for a useful recent collection of essays on legitimacy and international organizations, see the special issue of *Review of International Political Economy* on "Legitimacy and Global Governance", introduced by: James Brassetta & Elani Tsingou, *The Politics of Legitimate Global Governance*, 18 REV. INT'L POL. ECON. 1 (2011).

⁶ JOHN LOCKE, TWO TREATISES OF GOVERNMENT (Cambridge Univ. Press 1960) (1690), esp. Second Treatise, § 95-99.

⁷ ALEXIS DE TOCQUEVILLE, DEMOCRACY IN AMERICA 358 (Harvey C. Mansfield & Delba Winthrop trans., Univ. of Chicago Press 2000).

⁸ MAX WEBER, ECONOMY AND SOCIETY: AN OUTLINE OF INTERPRETIVE SOCIOLOGY 212-45 (Günther Roth & Claus Wittich trans., Univ. of California Press 1978).

⁹ Seymour Martin Lipset, *Some Social Requisites of Democracy: Economic Development and Political Legitimacy*, 53 AM. POL. SCI. REV. 69 (1959), quotes at 86 & 88.

Scholarship on legitimacy gained a new impetus from the proliferation of international organizations over the past three decades and the resulting expansion of governance in the absence of an international sovereign. Turning to global governance, Allan Buchanan and Robert Keohane have distinguished between normative legitimacy, “the right to rule”, and a sociological basis for legitimacy, “when it [the institution] is widely believed to have the right to rule”.¹⁰ Critics of organizations like the WTO, they observe, want to argue that multilateral governance lacks the right to rule because of a failure to protect human rights, labour, or the environment. Yet much of the scholarship on legitimacy drops sociological or historical considerations— in which institutions would be evaluated for their ability to earn the trust of interested communities over time, or in which researchers would seek to shed critical perspective on public demonstrations of legitimacy – to focus instead on normative criteria.¹¹ As part of this agenda, metrics for legitimacy have been proposed, including institutional integrity (actual performance measured against self-proclaimed goals), inclusiveness, accountability, transparency, and comparative benefit (substantive and procedural outcomes superior to those expected in the absence of the organization).¹²

At various points during its history since the end of WWII, the institution of free trade has confronted and overcome normative challenges to its legitimacy. However, it would be a mistake to suggest a planned, sequential process has built legitimacy for the General Agreement on Tariffs and Trade [GATT] or its successor, the WTO. Instead, the history of legitimizing free trade has involved advancing conceptual and economic arguments for reduced tariffs and other trade barriers while also persuading political elites of the benefits of GATT and WTO as the rule-makers for free trade. But a limit may have been reached. First, under the “bicycle theory” of trade, sequential liberalization builds the political support necessary to sustain the WTO and advance a new round of talks.¹³ However, as the Doha Round’s deadlock extends into a second decade, the domestic support necessary to sustain the WTO has begun to decline in both developed and developing countries. Second, free trade advocates have done little to manage either predicted (e.g., shifts in employment) or less expected (e.g., intensification of inequality) disruptions from global trade, sparking a backlash. The economist Dani

¹⁰ Allen Buchanan & Robert O. Keohane, *The Legitimacy of Global Governance Institutions*, 20 ETHICS & INT’L AFF. 405 (2006).

¹¹ A similar point is made by Steven Bernstein, who has proposed that legitimacy involves the interaction of communities of actors with broader institutionalized norms or social structures. See Steven Bernstein, *Legitimacy in Intergovernmental and Non-State Global Governance*, 18 REV. INT’L POL. ECON. 17 (2011).

¹² Robert O. Keohane, *Global Governance and Legitimacy*, 18 REV. INT’L POL. ECON. 99 (2011).

¹³ Kyle Bagwell & Robert W. Staiger, *A Theory of Managed Trade*, 80 AM. ECON. REV. 779 (1990).

Rodrik has suggested that globalization as an institution therefore is encountering a trilemma: it is impossible to simultaneously pursue democracy, national determination, and economic globalization.¹⁴ Third, while the DSB interprets trade agreements when ruling on disputes, only nations can enforce decisions. Nearly every ruling creates a domestic dilemma when organized special interests in the losing country object to a DSB decision. Furthermore, participating states with less economic clout are disadvantaged relative to wealthier countries, especially when imposing punitive tariffs will hurt poorer domestic consumers.

This article draws upon these findings while advancing a historical approach to the analysis of legitimacy that is distinct from those found in the political economy literature referenced above. I argue that the basis for legitimacy is changing over time, especially as the WTO interacts with organized interests, including member countries and NGOs. As the WTO took on a decidedly juridical process alongside ongoing multilateral negotiations of the Doha Round, the basis for institutional legitimacy likewise shifted. I argue that for the WTO, organizational legitimacy, namely the acceptance by governments, firms, and social movements of the WTO as the premier organization for trade negotiations and resolution of trade disputes, is inseparably intertwined with institutional legitimacy, which rests on the concept that free trade will benefit economies internationally.¹⁵ Challenges to the WTO's legitimacy that arise from its emerging function in adjudicating disputes, including decisions on models and econometric forecasting, thus have great significance for the underlying institution of free trade.

B. *Expertise Contests*

Arguments concerning legitimacy and the institution of free trade developed here are congruent with scholarship in STS on institutions and international organizations. STS departs from traditional political science, especially international relations, through its inquiry into the source of (scientific) ideas and how they gain credibility and authority in international settings. Compelling accounts of the power of ideas, according to STS, need to specify how the ideas come to be framed in particular ways and how these framings come to shape institutions.¹⁶ This article advances the analysis of political order resulting from particular

¹⁴ DANI RODRIK, *THE GLOBALIZATION PARADOX: DEMOCRACY AND THE FUTURE OF THE WORLD ECONOMY* 81-88, 200-206 (W.W. Norton 2011).

¹⁵ For more on the distinction between organizations and institutions, see DOUGLASS C. NORTH, *INSTITUTIONS, INSTITUTIONAL CHANGE, AND ECONOMIC PERFORMANCE* 3-10 (Cambridge Univ. Press 1990); Elias Khalil, *Organizations versus Institutions*, 151 *J. INST. & THEORETICAL ECON.* 445 (1995).

¹⁶ Sheila Jasanoff & Brian Wynne, *Science and Decision Making*, in *HUMAN CHOICE AND CLIMATE CHANGE: THE SOCIETAL FRAMEWORK* 1 (Steve Rayner & Elizabeth Malone eds., Batelle Press 1998).

framings of ideas through its focus on how the WTO has framed and adjudicated trade disputes to legitimise its organizational existence. Two topics of conceptual and empirical work in STS are of particular significance: dilemmas of expertise in international settings and the role of science in juridical proceedings.

Quandaries associated with scientific, technical, and biomedical expertise have long occupied scholars in STS and serve as a point of departure for critical analyses of power relations and scientific authority.¹⁷ Sheila Jasanoff concisely identified a core dilemma associated with experts: “They tame the ignorance and uncertainty that are endemic to modernity and pose threats to modernity’s democratic and managerial pretensions.”¹⁸ In studies of international institutions, STS has found that scientific experts must justify knowledge claims to more diverse groups (by education, technical knowledge, and epistemological viewpoints) than their peers, including informally designed “deliberative democracy” initiatives.¹⁹ Other work on expertise has identified how it acts as a barrier to representative participation or can even trap experts in “double-binds” when they cannot both intervene and maintain norms of neutrality and disinterestedness.²⁰

For experts drawn into legal and regulatory disputes, a challenge arises concerning specific and general knowledge in an epistemic contest. The expert is asked to draw conclusions based on their general technical knowledge and experience, rather than from the detailed analysis or direct observation of a specific case. Expert testimony then involves two key steps: first, the identification of a fit or misfit between known scientific or economic principles and the case at hand; and second, advancing a narrative and theory to explain various points of misalignment.²¹ Yet, these activities do not take place in a policy vacuum. For example, in the WTO dispute described here, it became impossible for either the U.S. Department of Agriculture or the Government of Brazil and their hired

¹⁷ See, for example, SERGIO SISMONDO, AN INTRODUCTION TO SCIENCE AND TECHNOLOGY STUDIES 180-88 (2d ed., Wiley-Blackwell 2010); Barry Barnes & David Edge, *Science as Expertise*, in SCIENCE IN CONTEXT: READINGS IN THE SOCIOLOGY OF SCIENCE 233 (Barry Barnes & David Edge eds., MIT Press 1982).

¹⁸ JASANOFF, *supra* note 1, at 267.

¹⁹ Eva Löwbrand et al., *A Democracy Paradox in Studies of Science and Technology*, 36 SCI. TECH. & HUM. VALUES 474 (2011).

²⁰ On expertise barriers, see Shobita Parthasarathy, *Breaking the Expertise Barrier: Understanding Activist Challenges to Science and Technology Policy Domains*, 37 SCI. & PUB. POL’Y 355 (2010); for the double-bind of expertise, see Arthur A. Daemrich, *A Tale of Two Experts: Thalidomide and Political Engagement in the United States and West Germany*, 15 SOC. HIST. MED. 137 (2002).

²¹ Joseph Sanders, *Science, Law and the Expert Witness*, 72 L. & CONTEMP. PROBS. 63 (2009); Arthur A. Daemrich, *The Evidence Does Not Speak for Itself: Expert Witnesses and the Organization of DNA-Typing Companies*, 28 SOC. STUD. SCI. 741 (1998).

experts to create new knowledge about the economic and behavioural outcomes produced by agricultural subsidies in a form that was separable from its political and policy implications. As a result, disputes over the correlation of econometric models to the real world mutated into clashes over the basis for expertise. More generally, the use of experts by the WTO poses an organizational dilemma as it seeks legitimacy through democratic and managerial procedures. The WTO's power increasingly lies in classifying, standardizing, and resolving epistemic disputes, including deciding on the validity of econometric models. This creates an inherent tension for the WTO going forward, and it may soon encounter epistemic challenges of the sort found regularly at the Intergovernmental Panel on Climate Change [IPCC] and at other international organizations.²²

Second, judicial cases and regulatory hearings have served as a productive site for scholars in STS to analyse disputes that depart from the bounded scepticism and often-collaborative peer-review system found in academic science.²³ Adversarial court proceedings can become disputes over the basis for expertise. Assumptions integral to the operation of complex models may appear faulty once opened to the scrutiny of judges and juries. While some research has found that juries can adopt nuanced views of scientific certainty, defendants with greater resources find it easier to challenge evidence and dispute methods.²⁴ To manage uncertainty and reduce blatant power asymmetries, courts and other organizations with judicial authority commonly narrow the kinds of evidence that can be presented and who can speak for it.²⁵ WTO dispute procedures have evolved in precisely this direction; as they define discoverable facts, they also establish the basis for expertise and deepen the WTO's standing as a judicial body. The DSB thus provides a structured approach to reasoning and deliberation, although unlike many legislative or judicial procedures, such as rulemaking by government agencies

²² For example, the authority of the IPCC has become deeply intertwined with disputes over approaches to modeling the global climate as well as causation of climate change; see Clark A. Miller, *Resisting Empire: Globalism, Relocalization, and the Politics of Knowledge*, in *EARTHLY POLITICS: LOCAL AND GLOBAL IN ENVIRONMENTAL GOVERNANCE* 81 (Sheila Jasanoff & Marybeth Long Martello eds., MIT Press 2004); Clark A. Miller, *Democratization, International Knowledge Institutions, and Global Governance*, *20 GOVERNANCE* 325 (2007).

²³ Robert K. Merton, *The Normative Structure of Science*, reprinted in ROBERT K. MERTON, *THE SOCIOLOGY OF SCIENCE* 67-78 (Univ. of Chicago Press 1979); STEVEN SHAPIN, *A SOCIAL HISTORY OF TRUTH* 3-41 (Univ. of Chicago Press 1994).

²⁴ Gary Edmond & David Mercer, *Scientific Literacy and the Jury: Reconsidering Jury 'Competence'*, *6 PUB. UNDERSTANDING SCI.* 329 (1997); MICHAEL LYNCH ET AL., *TRUTH MACHINE: THE CONTENTIOUS HISTORY OF DNA FINGERPRINTING* 39-68 (Univ. of Chicago Press 2008).

²⁵ SHEILA JASANOFF, *SCIENCE AT THE BAR: LAW, SCIENCE, AND TECHNOLOGY IN AMERICA* (Harvard Univ. Press 1995).

or jury trials in common law systems, it is not particularly public, visible, or participatory. Nevertheless, the WTO seeks legitimacy through the protection of weak and minority interests in the international system, thereby responding to challenges raised by some critics regarding arbitrary coercion and exploitation at the global level.²⁶ As a result, it is important to examine how the WTO responds to challenges over facts and the basis for scientific or economic knowledge, especially in cases with large wealth disparities between disputing parties. Of particular focus here are the ways in which contestation actually helps enable the exercise of power. As I will argue below, disputes at the WTO are now central to its institutional legitimacy and help to extend its functional role in a global free-trade system.

This article contributes to the understanding of epistemic contests by analyzing questions of expertise and the fit between economic models and real-world observations that arise in international trade disputes. I argue that through the development of a visibly deliberative approach to dispute resolution, the WTO gained legitimacy even though decision-making remains in the hands of a narrow band of technical and economic experts. According to the analysis developed here, the WTO dispute process is caught between representative legitimacy common to democratic systems and procedural legitimacy common to science and the law. Questions concerning the source and validity of knowledge claims about trade and development thus are not only central to the cotton dispute, but also figure generally in debates about the WTO's legitimacy as the organization responsible for the international trading system.

III. LEGITIMACY FROM MEMBERSHIP GROWTH AND DISPUTE MANAGEMENT

From its origins in the 1944 Bretton Woods plans, participants in GATT sought to expand membership.²⁷ Legitimacy of the GATT and the benefits of managed tariff reductions were demonstrated through additional countries joining during a period of growth; the membership grew from 23 countries negotiating the original GATT accords in 1946 to 128 signatory countries by 1994. After the founding of the WTO in 1995 and expansion of its mandate, issues of representation and reform of procedures governing negotiations came to the fore.²⁸ The dispute settlement body, one of the major organizational innovations of

²⁶ Robert O. Keohane, *Governance in a Partially Globalized World*, in GOVERNING GLOBALIZATION: POWER, AUTHORITY, AND GLOBAL GOVERNANCE 325-46 (David Held & Anthony McGrew eds., Polity Press 2002).

²⁷ ANWARUL HODA, TARIFF NEGOTIATIONS AND RENEGOTIATIONS UNDER THE GATT AND THE WTO: PROCEDURES AND PRACTICES (Cambridge Univ. Press 2001).

²⁸ Nitsan Chorev & Sarah Babb, *The Crisis of Neo liberalism and the Future of International Institutions: A Comparison of the IMF and the WTO*, 38 THEORY & SOC. 459 (2009).

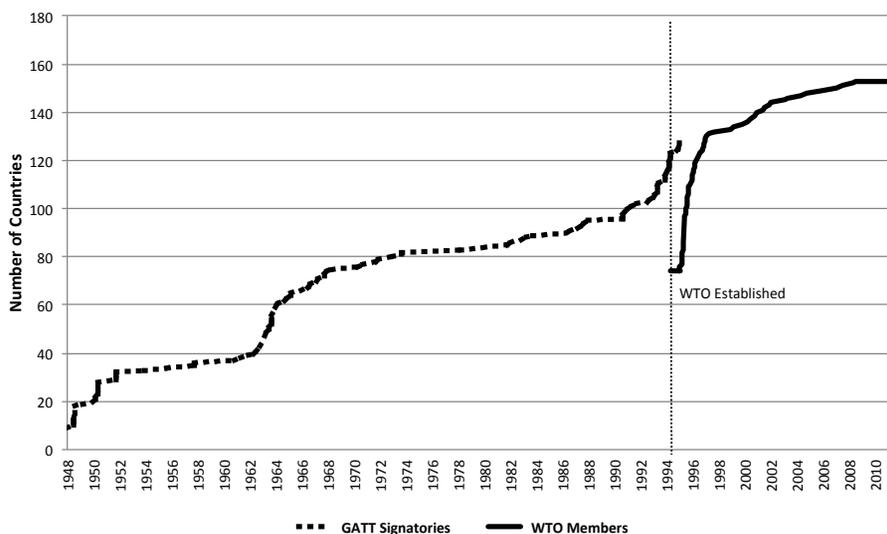
the Uruguay Round, came under particular attention concerning issues of access and balanced outcomes between developed and developing countries. This section traces this development in history and shows how the significance of dispute resolution has grown in the contemporary times to legitimise the WTO.

A. Founding the WTO

The WTO was created in 1995 as part of a major Uruguay Round accord. During the nine years of negotiations starting in 1986, the Uruguay agenda covered tariff reductions on goods; non-tariff barriers, including subsidies, import procedures, government procurement, and customs valuation methods; new issues of intellectual property and international investment; and dispute settlement procedures. On April 15, 1994, the round was completed with pledges for significant tariff reductions, promises to remove non-tariff trade barriers, and an agreement on dispute resolution and enforcement governed by a new organization, the WTO. In addition to the existing GATT agreements, the WTO gained oversight of the new General Agreement on Trade in Services [GATS], Trade-related Aspects of Intellectual Property Rights [TRIPS], Trade-Related Investment Measures [TRIMS], and sector-specific accords, including the Agreement on Agriculture [AoA], the Agreement on Textiles and Clothing [ATC], and a revised agreement on Sanitary and Phytosanitary Measures [SPS]. Broadly, the WTO now had mandates that impinged on national governments in politically sensitive areas of agriculture, product safety, health, environment, innovation, and competition policy.

Reflecting tensions prevalent in the Uruguay Round, some countries continued to sign the GATT agreements through the end of 1995, even as over 70 countries joined the WTO. However, from 128 GATT signatories, the initial WTO membership dropped to 74 countries and only reached the prior GATT numbers in 1998 (see figure 1). Membership subsequently grew more slowly, especially once Doha Round disputes made the benefits of joining less clear to the 39 countries recognized by the United Nations that had not joined the WTO.

Figure 1. GATT and WTO Cumulative Membership



Source: Adapted from WTO, “WTO Membership”, http://wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm.

While the Uruguay Round agreements were hailed as a major breakthrough in the contentious history of trade negotiations, they also generated disputes between developed and developing countries and drew the attention of NGOs and activists. A group of developing countries sometimes called the ‘G-10 hardliners’ – led by Brazil and India – initially opposed the inclusion of services, intellectual property rights, and investment measures in trade talks.²⁹ The final agreement ultimately hinged on a ‘grand bargain’ that differed from the traditional reciprocity of opening markets and lowering tariffs between countries for the same class of goods. The new deal held that OECD member countries would open their markets to agricultural and labour-intensive manufactured goods, including foodstuffs and clothing; in exchange, developing countries would enforce intellectual property and open financial markets to outside investors.

But the grand bargain also reinforced divisions between developed and developing nations that proved significant to the WTO’s legitimacy. Developing countries argued that the WTO negotiating process was biased in favour of rich countries and resented pressure to sign the Uruguay deal. Subsequent WTO meetings grew acrimonious. The 1999 Seattle meeting featured thousands of

²⁹ CHAD P. BOWN, SELF-ENFORCING TRADE: DEVELOPING COUNTRIES AND WTO DISPUTE SETTLEMENT 22-44 (Brookings Institution Press 2009) [hereinafter BOWN].

protesters on the streets, violent clashes with police, and vociferous disputes in meeting rooms. It ended with a walkout by delegates from most developing countries.³⁰ In a stinging rebuke of the view that WTO agreements allowed a managed transition to free trade and would promote general prosperity, protesters characterized the WTO as “the most effective anti-democratic institution on earth”.³¹ While adopting a more moderate tone, representatives from developing countries – comprising the majority of new WTO membership – found that the institution operated with tacit rules. Negotiating rounds involved large sessions, but key decisions were made in smaller working groups dominated by the largest economies. Expecting a more open and democratic process, numerous countries raised the issue of how the WTO could claim to speak for all members when many felt coerced into joining by the necessity of belonging to the international trading system.³²

B. *The Doha Round*

Nevertheless, at the fourth Ministerial Conference in Doha, Qatar, in November 2001, WTO members agreed to launch a new negotiation round. Formally, the talks were called the “Doha Development Agenda”, rather than a new “Round”. Fundamental differences immediately emerged concerning agricultural subsidies and intellectual property rights that were not easily resolved, even under the rubric of development. Talks at Doha concluded with a 10-page declaration that reaffirmed member states’ rights to regulate domestically, notably environment, labour, and services.³³ It also outlined technical assistance and capacity building initiatives for developing countries.³⁴ Delegates announced a “work programme” of negotiations on agriculture, services, intellectual property, international investment, competition policy, government procurement, and WTO governance.³⁵

Meetings in Cancún in September 2003 revealed a hardening of positions on

³⁰ Sylvia Ostry, *The World Trading System: In the Fog of Uncertainty*, 1 REV. INT’L ORG. 139 (2006).

³¹ John Passacantando, *Dark Power of the WTO*, DENV. POST, Nov. 20, 1991, at B11.

³² Gregory Shaffer, *Power, Governance and the WTO: A Comparative Institutional Approach*, in POWER IN GLOBAL GOVERNANCE 130 (Michael Barnett & Raymond Duvall eds., Cambridge Univ. Press 2005); Bhupinder Chimni, *The WTO, Democracy, and Development: A View from the South*, in MAKING GLOBAL TRADE GOVERNANCE WORK FOR DEVELOPMENT 261 (Carolyn Birkbeck ed., Cambridge Univ. Press 2011).

³³ World Trade Organization, Ministerial Declaration of 14 November 2001, WT/MIN(01)/DEC/1, http://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_e.htm.

³⁴ *Id.*

³⁵ *Id.*

agricultural subsidies, intellectual property rights, and four “Singapore” issues (named for the first WTO ministerial conference held in Singapore in 1996), namely international investment, competition policy, government procurement, and trade facilitation.³⁶ Capital flows and investment were particularly contentious in the wake of the 1997 Asian financial crisis. The Cancún meeting also featured a recalibration of North - South relations in WTO negotiations. For example, Zimbabwe’s Ambassador Chidyausiku spoke for many developing countries when he observed: “In Doha, they created a process where Ministers could go to the Committee of the Whole and discuss and raise issues, but nobody was taking into account what they said ... In fact, there was a smaller group taking the decisions for the whole.”³⁷ A WTO G-20 was forged among developing countries, led by Brazil, China, and India, which agreed to negotiate as a unified bloc. Representing 70% of the world’s rural population, the G-20 criticized efforts by the United States and the European Union to continue domestic farm subsidies and agricultural export supports. At the same time, some members, notably India, objected to cutting tariffs on imported agricultural products, and four West African countries sought a specific agreement on ending cotton subsidies in the United States.³⁸ The Cancún meeting ended in disarray. North - South tensions continued unabated in follow-up meetings, despite an agreement to drop the Singapore issues from negotiations.

Nevertheless, by 2012 the WTO’s leadership celebrated the breadth of membership and deliberative sequence of Doha Round discussions. Writing in a blog, WTO director-general Pascal Lamy observed that the tenor had changed as the WTO ceased integrating new members and began to hold negotiations exclusively in Geneva. Reflecting on a 2010 meeting, he stated: “There were no surprises. It was not a big jamboree, with thousands of journalists, hugely costly arrangements and sleepless nights. But a feeling of normality, a feeling that the WTO is a solid institution. This conference was more like a shareholders meeting to review annual activities and priorities.”³⁹ Yet, the calm that Lamy celebrated was of an institution on a plateau. Membership had levelled off at 153 countries. Developed countries were seeking greater access to high-growth markets in middle-income countries for financial services, medicines, entertainment, and agricultural goods. But poorer nations had limited options for agricultural and

³⁶ Melaku Desta, *The Bumpy Ride Towards the Establishment of “A Fair and Market-Oriented Agricultural Trading System” at the WTO: Reflections following the Cancun Setback*, 8 DRAKE J. AGRIC. L. 489 (2003).

³⁷ AILEEN KWA, POWER POLITICS IN THE WTO 26 (Focus on the Global South 2003) [hereinafter KWA].

³⁸ *The WTO Under Fire*, ECONOMIST, Sept. 20, 2003, at 26-28.

³⁹ Pascal Lamy, Pascal Lamy’s Ministerial Conference Blog (Dec. 2, 2010), WORLD TRADE ORGANIZATION, http://www.wto.org/english/thewto_e/minist_e/min09_e/blog_e.htm.

manufactured exports, and commonly were dependent on a small number of purchasers locked in through bilateral agreements. A Doha Round compromise could expand trade globally, yet fundamental differences on domestic subsidies and other non-tariff issues meant that few proposals for compromise were emerging from either side.

For decades, first GATT and then the WTO derived legitimacy from demonstrating the network effects of membership. By joining, countries could access larger markets for exports and engage in trade negotiations in a more balanced forum than found in many bilateral settings. However, as the Doha Round began, developing countries challenged WTO negotiations as biased in favour of rich country interests and therefore lacking legitimacy. The creation of a WTO G-20 by rising middle-income nations shifted negotiations from intellectual property enforcement and capital flow liberalization (of concern to the United States and European Union) to agriculture. However, with membership growth stalled and negotiation meetings breaking down in acrimony, the WTO's legitimacy as the peak organization for trade discussions came under more sustained attack than in the past, and trade negotiations independent of the WTO framework became attractive to many countries.

C. *Balancing Dispute Filings*

Whereas GATT relied on the agreement of all members (including the offending country) to levy sanctions, the Uruguay Round accords established the DSB with power to rule on trade disputes, monitor implementation, and authorize retaliation if countries failed to comply.⁴⁰ According to numerous studies, disputes filed under GATT and the DSB in its early years were resolved primarily through negotiated settlements, largely to the benefit of developed country complainants.⁴¹ Developing countries settled early and for less advantageous outcomes than were possible.⁴² Critics argued that the DSB was biased against developing countries.⁴³ However, it was unclear whether the bias stemmed from an explicit preference for

⁴⁰ See Understanding on Rules and Procedures Governing the Settlement of Disputes, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 2, 1869 U.N.T.S. 401, 33 I.L.M. 1226 (1994) [hereinafter DSU].

⁴¹ GREGORY SHAFFER, *DEFENDING INTERESTS: PUBLIC-PRIVATE PARTNERSHIPS IN WTO LITIGATION* (Brookings Institution Press 2003); Marc Busch & Eric Reinhardt, *Bargaining in the Shadow of the Law: Early Settlement in GATT/WTO Disputes*, 24 *FORDHAM INT'L L. J.* 158 (2000).

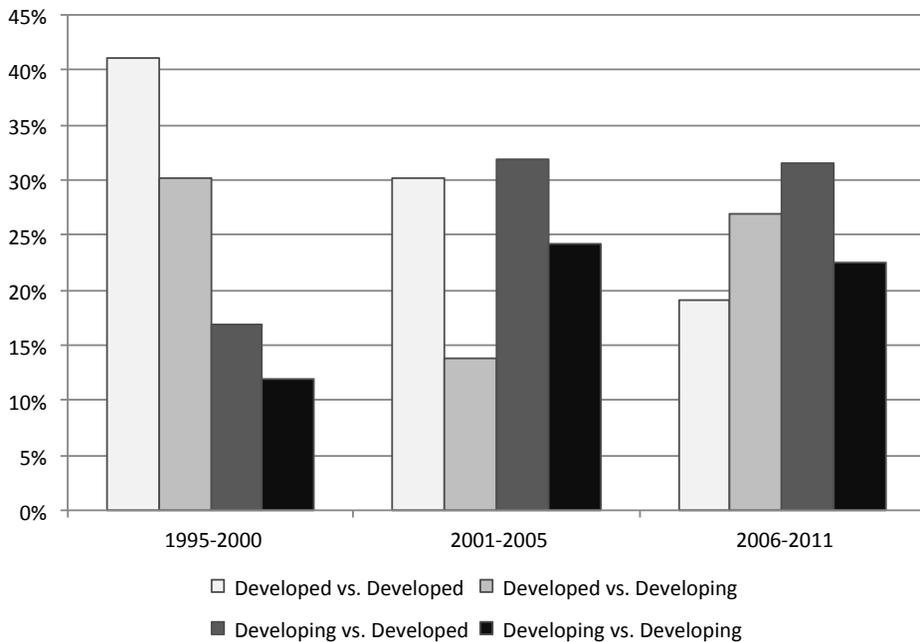
⁴² Marc Busch & Eric Reinhardt, *Developing Countries and General Agreement on Tariffs and Trade*, 37 *J. WORLD TRADE* 719 (2003).

⁴³ KWA, *supra* note 37; for additional analysis of critics of the WTO, see Gregory Shaffer, *How to Make the WTO Dispute Settlement System Work for Developing Countries*, Int'l Ctr. for Trade & Sustainable Dev. (Resource Paper No. 5, 2003).

rich country interests, unequal access to the financial, econometric, and legal resources necessary to bring and sustain a dispute, or peculiarities of the cases brought in the late 1990s and early 2000s. For the WTO, however, perception of bias in the dispute process by the mid-2000s posed the threat that countries would not enforce decisions or that suits would be brought by only a few participants in the international system.

In the DSB’s early years, the United States and European countries filed most claims, both against one another and against developing countries (see figure 2). By the latter half of the 2000s, new complaints were on a more even footing, primarily because developed countries were filing fewer disputes against one another or against developing countries. As a percentage of new disputes initiated, complaints by developing countries against developed nations shifted from 16 percent in the five years starting in 1995 to over 30 percent subsequently. Critics nevertheless, have continued to attack the WTO as lacking legitimacy, partly because of cost and legal and technical expertise barriers faced by developing countries seeking to file disputes and partly for delayed compliance by rich-world countries to unfavourable rulings.

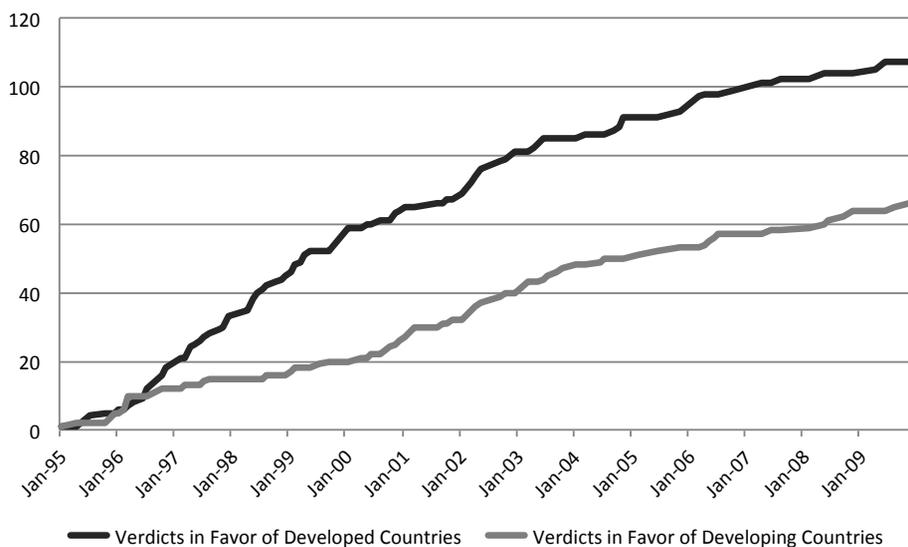
Figure 2. WTO Disputes Initiated



Source: Adapted from WTO, “Dispute Settlement: The Disputes”, http://www.wto.org/english/tratop_e/dispu_e/dispu_status_e.htm

An analysis of 424 disputes filed since the formal creation of the WTO in 1995 reveals a balancing of dispute filings and panel rulings over the course of the past 16 years. To better understand this shift I created a data set from WTO sources encompassing 424 disputes completed or underway as of late 2011. Disputes were categorized by complainants (developed versus developing country, using OECD definitions) and by DSB rulings, including by appellate panels and arbitrators. Of the WTO dispute cases initiated since the Uruguay Round agreement was signed, nearly 60 percent have achieved a clear resolution in one of three ways: a panel ruling by the DSB with enforcement by the winning party, a mutually agreed settlement, or withdrawal of the dispute by the complainant. A win or loss was determined by reading panel, appellate, and arbitrator reports. For the majority of cases that reached a final ruling, outcomes were clear. In other cases, decisions were coded based on the preponderance of DSB rulings. If a claimant won 75 percent or more of their arguments or if the defendant conceded to 75 percent or more of the dispute by agreeing to implement DSB recommendations, the case was coded as a win. Cases also were coded as wins for the complainant if withdrawn prior to final ruling because the defendant removed the domestic policies in question. For a small number of cases under a second round of appeals (1 percent of the total), wins or losses were coded based on the preponderance of the previous two rulings since DSB panels are unlikely to reverse two prior rulings. For mutually agreed outcomes, cases were coded as wins for complainants if the compromise required the losing side to make domestic policy changes (e.g., by removing tariffs or eliminating subsidies). Cases characterized by the WTO as mutually agreed solutions that did not describe the exact settlement were dropped from the analysis. Withdrawn disputes that were the result of the defendant removing the policy in question were coded as wins for the complainant. The remaining 40 percent of cases are presently in consultation (32 percent), awaiting creation of a panel (5 percent), or are under review by constituted panels (3 percent). Seven cases are in limbo since the terms of their DSB panels expired; these were not included in the analysis.

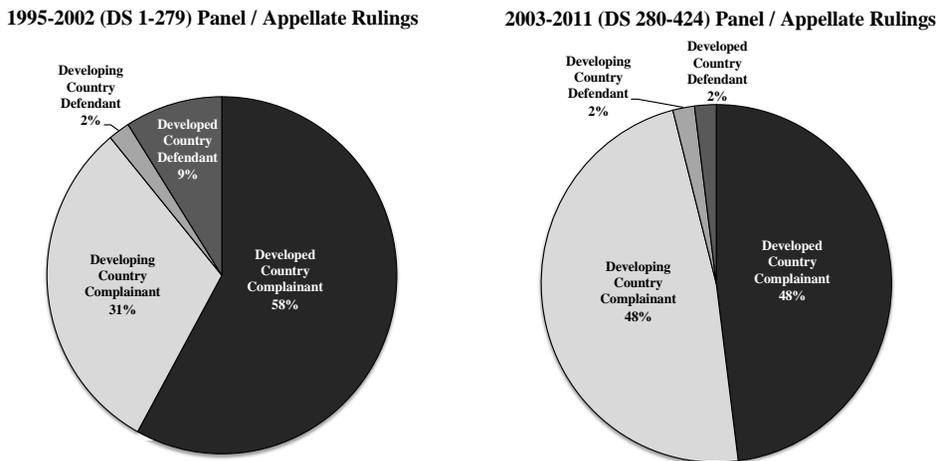
Figure 3. Cumulative WTO Dispute Rulings



Source: Adapted from WTO, "Dispute Settlement: The Disputes", http://www.wto.org/english/tratop_e/dispu_e/dispu_status_e.htm

Considering the totality of disputes since the DSB began its work in 1995, a pattern of greater global parity emerges. From initiating over 70 percent of disputes between 1995 and 2000, developed countries brought 44 percent of new disputes thereafter (see Figure 2). Final verdicts by the DSB also show a shift over time towards greater equality between developed and developing countries, although with a pronounced differential dating to the second half of the 1990s. Roughly half of all cases have been resolved through early settlement or suspended in light of ongoing negotiations among disputing countries. Of the disputes that have reached final verdicts, developed countries continue to hold a nearly two to one ratio. Yet much of this differential stems from significant discrepancies in rulings between mid-1996 and early 2001. Since that time, the DSB has issued final rulings in favour of developed and developing countries at a nearly equal rate of frequency.

Figure 4. Balancing WTO Dispute Outcomes



Source: Adapted from WTO, "Dispute Settlement: The Disputes", http://www.wto.org/english/tratop_e/dispu_e/dispu_status_e.htm

Analysis of dispute outcomes over the past sixteen years similarly reveals a trend toward greater balance between developed and developing countries (see Figures 3 and 4). Dividing the DSB's history in half, a notable recalibration of dispute outcomes has occurred since 2003. Two specific points can be made concerning dispute outcomes that are of importance to the organizational legitimacy of the WTO and the institutional legitimacy of the free trade system. First, whereas developed countries as complainants or defendants won two-thirds of cases between 1995 and 2002, parity was achieved between developed and developing countries between 2003 and 2011. The balance occurred primarily because developing countries began to win more cases as complainants. Second, it is striking that complainants in recent years have been winning nearly every case in which a clear outcome can be identified. Even in the case of negotiated settlements, defendants have been forced to change policies.

Broadly, developing countries participating in the international trading system appear to be learning over time what cases to bring and how to win. At the same time, the emergence of a global common law that governs international trade through cumulative DSB rulings has incrementally reduced uncertainty and alternative interpretations of underlying WTO agreements. The legitimacy of the international trading system has been strengthened, especially in developing countries, thanks to clear outcomes of final rulings or disputes withdrawn because respondents modified trade policies. Nevertheless, as the Brazil – United States

case analyzed below demonstrates, DSB decisions sometimes encountered significant resistance when they went against the interests of major powers.

IV. LEGITIMACY THROUGH DISPUTE ADJUDICATION

As a direct consequence of the DSB's growing role, juridical legitimacy became critical for the WTO. Dilemmas emerged in which experts, selected for training and knowledge rather than for their representation of national or specific industry sector interests, determined technical issues which had deep political and economic ramifications. In areas ranging across the international effects of domestic subsidies, the environmental effects of trade, and the labelling of foods, policy choices were recast as scientific and technical questions to be solved by experts.⁴⁴ While this "technical turn" helped to limit challenges to the credibility of panel members and the DSB as a ruling body, it made claims for the democratic legitimacy of the WTO more difficult to sustain. Furthermore, by taking on a juridical role, the WTO deepened its organizational role in the global system. A body of common law thus emerged for international trade in the form of rulings written in a rational, neutral, and technical-legal language, including citations to previous decisions and references to economic and scientific principles.⁴⁵

To analyze the implications of epistemic contests for the WTO that have arisen in the course of this shift to more technical adjudication and the writing of common law governing trade, this section focuses on the Agreement on Agriculture and the *US-Upland Cotton* dispute between Brazil and the United States.⁴⁶ I find that the AoA appeared largely unenforceable when the United States and European Union delayed and in some cases violated its core tenets. However, research into the cotton dispute demonstrates that once Brazil invested considerable resources to advance the dispute, it could draw upon a narrow legal interpretation of the AoA to win a major DSB ruling. At the same time, and of significance for the future of the WTO, technical issues with broader policy ramifications emerged, as dispute settlement panelists engaged with an econometric model used to quantify market distortions and costs to farmers from U.S. agricultural subsidies. I argue that the dispute shifted sequentially from technical questions concerning cotton supply and demand elasticity to the existence of a world market and single price for cotton to questions of access to econometric models and protected information about farms and farmers.

⁴⁴ BOWN, *supra* note 29.

⁴⁵ Surya Subedi, *WTO Dispute Settlement Mechanism as a New Technique for Settling Disputes in International Law*, in *INTERNATIONAL LAW AND DISPUTE SETTLEMENT: NEW PROBLEMS AND TECHNIQUES* 173 (Duncan French et. al. eds., Hart Publishing 2010).

⁴⁶ *United States – Subsidies on Upland Cotton*, DS267 (General reference to the WTO dispute), http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds267_e.htm.

Understanding this sequence is of significance also for future epistemic contests that will arise at the DSB.

A. Agriculture and Trade

Under the 1947 GATT agreement, tariffs on industrial and agricultural products were to be lowered together. In practice, successive negotiation rounds excluded agriculture in order to achieve consensus on other tariff reductions. A breakthrough came in the 1994 Agreement on Agriculture⁴⁷, part of the Uruguay Round agreements. Under the AoA, countries had set schedules to follow when reducing subsidies and tariffs. With the launch of the Doha Round, export subsidies were to be “phased out”, not just reduced. The United States, European Union, and most other OECD countries agreed to sort domestic support into three conceptual “boxes”: a permissible green box, a transitional blue box, and an amber box set for reduction. Green box policies were believed to have minimal effects on production and trade; these included conservation programs, scientific research, and nutrition programs such as food stamps. Amber box policies had direct effects on production and trade; they were to be reduced over time from baseline levels. Policies labelled amber varied by economic development level, but broadly included counter-cyclical payments, direct price supports by volume of harvested crop, and government-subsidized loans to farmers or crop purchasers. The blue box was believed by developing countries to be a short-term transition mechanism, but proved controversial when the European Union and United States sought to use it to postpone major changes to domestic subsidies.⁴⁸

While some parties believed the longer-term ambition of the AoA was to completely eliminate production and export subsidies, the agreement itself called only for their reduction through three key provisions. First, it gave countries 6 years from January 1, 1995 (10 years for developing countries)⁴⁹, to implement the agreement.⁵⁰ Second, “special safeguard” provisions allowed countries to raise tariffs temporarily if import volumes spiked or if the price of imports dropped suddenly.⁵¹ Third, a “peace clause” in article 13 stated that countries would exercise “restraint” from initiating WTO disputes or introducing countervailing duties based on other GATT or WTO agreements until the end of 2003.⁵² The United

⁴⁷ See Agreement on Agriculture, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1867 U.N.T.S. 410 [hereinafter AOA].

⁴⁸ MELAKU DESTA, *THE LAW OF INTERNATIONAL TRADE IN AGRICULTURAL PRODUCTS: FROM GATT 1947 TO THE WTO AGREEMENT ON AGRICULTURE* (Kluwer Int'l 2002).

⁴⁹ See AOA art. 15(2).

⁵⁰ See AOA art. 1(f).

⁵¹ See AOA art. 5.

⁵² See AOA art. 13(c)(i).

States and European Union interpreted this clause to provide immunity from dispute claims so long as they demonstrated progress toward AoA commitments.⁵³

B. *Brazil and the WTO*

As the Uruguay Round agreements came into effect, several developing countries created explicit WTO negotiation strategies and a few focused on the dispute process.⁵⁴In particular, Brazil's president Luiz Inácio Lula da Silva (Lula) took a leading role in WTO negotiations. Lula's approach contrasted with that of his predecessor, Fernando Cardoso, who had led Brazil's accession to the WTO in 1995 as part of an economic liberalization strategy.

Prior to Lula's presidency, the Brazilian government had set up an office for the General Coordination of Disputes (Coordenação Geral de Contenciosos, or CGC) within the foreign ministry. CGC was created in response to the domestic view that the government did not sufficiently understand the emerging rules for international trade and was doing a poor job of representing Brazilian interests internationally. This perception was exacerbated over the course of four high-profile WTO disputes between Canada and Brazil concerning subsidies to the airplane manufacturers Embraer and Bombardier.⁵⁵ After Lula began his presidency in 2003, the CDC's role was strengthened. Brazil's agricultural ministry also grew increasingly aware of arguments by economists concerning the distortionary effects of U.S. and EU subsidies. Officials at CGC and Brazil's agricultural ministry then began to consider test cases against both the United States and the European Union to hold them accountable to WTO commitments. For the United States, Brazil's initial focus was on soybean subsidies; for the European Union, the focus was on sugar subsidies.⁵⁶

⁵³ WTO Secretariat, *WTO AGRICULTURAL NEGOTIATIONS: THE ISSUES, AND WHERE WE ARE NOW* (2004), http://www.wto.org/english/tratop_e/agric_e/agnegs_bkgrnd_e.pdf; RANDY SCHNEPF & CHARLES E. HANRAHAN, CONG. RESEARCH SERV., RS22927, *WTO DOHA ROUND: IMPLICATIONS FOR U.S. AGRICULTURE* (Jan. 4, 2010).

⁵⁴ Notable WTO complainant countries in the 2000s included Brazil (26 complaints), Mexico (21 complaints), India (20 complaints) and Argentina (14 complaints). See Arthur A. Daemrich, *Stalemate at the WTO: TRIPS, Agricultural Subsidies, and the Doha Round*, HARV. BUS. SCH. BGIE Unit Case No. 711-043, (2011), available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1991981.

⁵⁵ Gregory Shaffer et al., *The Trials of Winning at the WTO: What Lies Behind Brazil's Success*, 41 CORNELL INT'L L.J. 383 (2008) [hereinafter Shaffer et al.]; Christiane Aquino & Diego Bonomo, *O Brasil e o Sistema Multilateral de Comércio: Criação de Capacidades*, 4 PONTES 19-20 (July 2008), available at: <http://ictsd.org/i/news/pontes/17407/>.

⁵⁶ Maintaining the parity between the United States and the European Union, Brazil eventually filed two major dispute claims on September 27, 2002. See Panel Report, *European Communities – Export Subsidies on Sugar*, WT/DS266/R (Oct. 15, 2004), and Panel

Brazil's policymakers turned their attention from soy to cotton after participating in conferences of the International Cotton Advisory Committee [ICAC] and reading studies by Oxfam International and other organizations in the early 2000s.⁵⁷ Cotton prices had dropped by 40 percent between December 2000 and May 2002. While the decline was partly blamed on the 2001 recession, numerous studies identified countercyclical payments by the U.S. government as a major culprit.⁵⁸ Even economists at the World Bank took notice of some \$4 billion in U.S. cotton subsidies in 2002, a year in which the world cotton market was estimated at \$20 billion.⁵⁹ At an ICAC conference that year, several economists extrapolated from the U.S. government, data on subsidies and output to quantify how much cotton would have been produced if not for the policies under question. They held that U.S. production would have declined by between 900,000 and 1.4 million tons in the years 1999-2002, with world cotton prices higher by between 6 and 22 cents.⁶⁰ In the interim, soybean prices were rising internationally thanks to the strong domestic demand in China; as a consequence, U.S. subsidies to soybean farmers declined and a WTO case looked weak.⁶¹

C. Brazil – United States Cotton Dispute

Agricultural subsidies in Brazil were modest, averaging below 6 percent of total farm income, compared with 12 percent in the United States and 29 percent in the European Union.⁶² The primary route for government assistance to agriculture was through research and large-scale soil improvement programs spearheaded by the Brazilian Agricultural Research Corporation (Empresa Brasileira de Pesquisa Agropecuária, or Embrapa). Over the course of the 1980s and 1990s, Embrapa's programs added phosphorus and lime to improve the soil in

Report, *United States – Subsidies on Upland Cotton*, WT/DS267/R (Sept. 8, 2004) [hereinafter *US – Cotton*].

⁵⁷ INT'L COTTON ADVISORY COMM., PRODUCTION AND TRADE POLICIES AFFECTING THE COTTON INDUSTRY (2002) [hereinafter ICAC – COTTON]; Kevin Watkins, *Cultivating Poverty: The Impact of Cotton Subsidies on Africa* (Oxfam Briefing Paper 30, 2002); Kimberley Pfeifer et al., *Finding the Moral Fiber* (Oxfam Briefing Paper 69, 2004).

⁵⁸ Jesús Antón & Chantal Le Mouél, *Do Counter-Cyclical Payments in the 2002 US Farm Act Create Incentives to Produce?*, 31 AGRIC. ECON. 277 (2004); Suwen Pan et al., *The Impacts of U.S. Cotton Programs on the World Market: An Analysis of Brazilian WTO Petition*, 10 J. COTTON SCI. 180 (2006).

⁵⁹ John Baffes, *The Cotton Problem*, 20 WORLD BANK RES. OBSERVER 109 (2005).

⁶⁰ ICAC - Cotton, *supra* note 57, at 8.

⁶¹ Interview with Celso de Tarso Pereira, General Coordinator for Dispute Settlement, Coordenação-Geral de Contenciosos, Brasília (Jan. 14, 2011) [hereinafter Interview with Pereira].

⁶² Organisation for Economic Cooperation and Development, Agricultural Policy Indicators: Producer and Consumer Support Estimates, <http://stats.oecd.org>.

Brazil's vast *cerrado* (savannah), developed strains of commodity crops that prospered in the Brazilian climate, and helped underwrite the uptake of new machinery and farming technologies.⁶³ Cotton farming in Brazil shifted from south-eastern states to the large interior states of Mato Grosso and Goiás, and yields improved from below 200 kilograms per hectare (kg/ha) in the 1980s to a world-leading 1,450 kg/ha by 2009 (cotton yields in the United States averaged 920 kg/ha).⁶⁴

In 1999, growers from Mato Grosso took the lead in setting up a new trade association, the Brazilian Association of Cotton Producers (Associação Brasileira dos Produtores de Algodão, or Abrapa). Abrapa quickly began to develop expertise on WTO agreements and hired legal representation to assist in preparing a case against the United States. Members also began to pool resources; from an initial estimate of approximately \$200,000 that Abrapa would need to contribute to a WTO dispute, spending eventually grew to nearly \$3.5 million over the course of eight years.⁶⁵ While the Brazilian foreign ministry's CGC department took the official lead in the eventual cotton dispute, Abrapa remained involved throughout by providing data on Brazilian cotton production and by underwriting some of the legal fees and costs of hiring agricultural economists and other experts.

The Brazilian government proceeded to file a complaint against U.S. cotton subsidies on September 27, 2002. After consultations with the United States following the official complaint failed to reach a resolution, the Brazilian government initiated an official dispute, with a DSB panel announced in March 2003. Under WTO rules, the DSB panel was composed with three members: Dariusz Rosati, an academic economist and Poland's foreign minister for several years in the mid-1990s; Mario Matus, a member of Chile's foreign ministry specializing in bilateral trade issues; and Daniel Moulis, a private-sector lawyer from Australia.

Brazil's case was based on four claims concerning U.S. government programs that allegedly violated the AoA and created "serious injury" to Brazilian cotton exporters. First, Brazil argued that U.S. cotton subsidies, which under the AoA were supposed to decline from a 1992 benchmark, had instead increased.⁶⁶ In

⁶³ *The Miracle of the Cerrado*, *ECONOMIST*, Aug. 28, 2010, at 58–60.

⁶⁴ Instituto de Pesquisa Econômica Aplicada, Ipeadata Regional: Agropecuária, www.ipeadata.gov.br; JAMES KIAWU ET AL., BRAZIL'S COTTON INDUSTRY: ECONOMIC REFORM AND DEVELOPMENT (U.S. DEPT. AGRIC. ECO. RESEARCH SERV. (2011), <http://www.ers.usda.gov/Publications/CWS/2011/06Jun/CWS11D01/CWS11D01.pdf>.

⁶⁵ Interview with Haraldo Cunha, Executive President, Instituto Brasileiro do Algodão, Brasília (Jan. 12, 2011).

⁶⁶ Request for Consultations by Brazil, *United States – Subsidies on Upland Cotton*, WT/DS267/R (Oct. 3, 2002), at 5 [hereinafter Request for Consultations by Brazil].

2000, a year of low cotton prices, American cotton producers received \$4.6 billion in government aid; even as prices rose, U.S. growers averaged \$3.5 billion from government programs, supplementing an average annual harvest value of \$4.3 billion.⁶⁷ Second, Brazil claimed that production flexibility contract payments (in the 1996 farm bill) and direct payments (in the 2002 farm bill), both of which paid farmers not to plant fruits, vegetables, or wild rice, violated WTO provisions regarding trade-distorting subsidies.⁶⁸ In effect, these aspects of the U.S. farm bill pushed farmers to grow even more cotton instead of considering other crops. Third, Brazil protested market loss assistance and so-called Step 2 payments, which compensated domestic mills and exporters for the price difference between U.S. cotton and the average of the five lowest foreign market prices for the year. Fourth, Brazil argued that export credit guarantees, which included loans to traders and subsidized credit to foreign banks for the purchase of U.S. agricultural products, violated the AoA.⁶⁹ The overall effect, by Brazil's calculation, was a global cotton price depressed by nearly 13 percent and there was a "serious prejudice" to the interests of Brazilian farmers, who lost nearly \$480 million in direct revenues over the 1999-2002 growing seasons. Brazil claimed \$600 million in total losses for 2001 alone, based on the total "lost revenue, lost production, losses of related services, lost federal and state revenue, higher unemployment and losses in Brazil's trade balance".⁷⁰

From the perspective of the United States, cotton was a rare bright spot compared to other declining exports. As domestic uses declined with a shift in clothing production to China and other Asian countries, U.S. cotton exports grew from 25 percent of the world market in the 1990s to 37 percent in the 2000s, earning \$2.9 billion annually. Although cotton production accounted for just 0.03 percent of U.S. GDP, it employed more than 150,000 people on 18,000 farms, with an estimated 200,000 additional jobs in textile mills, cottonseed oil production, and related businesses.⁷¹

Responding to Brazil's WTO complaint, the U.S. government invoked both technical and legal defences. First and foremost, the United States argued that the AoA's peace clause granted signatory countries until 2004 to phase out domestic subsidies and export promotions. According to the United States, Article 13 of the

⁶⁷ RANDY SCHNEPF, CONG. RESEARCH SERV., RS75700, BRAZIL'S WTO CASE AGAINST THE U.S. COTTON PROGRAM 5 (Apr. 6, 2010) [hereinafter SCHNEPF].

⁶⁸ Request for Consultations by Brazil, *supra* note 66, at 6.

⁶⁹ US – *Subsidies on Cotton*, *supra* note 56; U.S. DEPT. AGRIC., EXPORT CREDIT GUARANTEE PROGRAM (GSM-102) (Nov. 2009), *available at*: <http://www.fas.usda.gov/info/factsheets/gsm102-03.asp>.

⁷⁰ Request for Consultations by Brazil, *supra* note 66, at 7.

⁷¹ U.S. DEPT. AGRIC. ECON. RES. SERV., COTTON, <http://www.ers.usda.gov/Briefing/Cotton/>.

AoA superseded other agreements and Brazil's dispute had no standing. Second, the United States explained that key programs under question, including production flexibility contracts and market loss assistance, had already expired by the time Brazil initiated the dispute. Since they no longer existed, it made little sense to have the DSB rule them illegal. Third, the United States argued that other subsidies were permissible under the AoA. These included direct payments made regardless of production volume or crop type, as well as support for cotton farmers that guaranteed a baseline income of 72.9 cents per pound of harvested crop.⁷²

American cotton farmers, concentrated in southern and Midwestern states, saw their livelihoods threatened by the WTO dispute and lobbied the U.S. Congress.⁷³ They warned that the cotton market was inherently unstable without subsidies and price swings would hurt consumers. In the 2004 House Agricultural Committee hearings, Charles Stenholm, the ranking Democratic minority member and a Texas cotton farmer, claimed, "Brazil is the world's eighth largest economy and yet calls itself a developing country. Despite its strength as an agricultural exporter, it deliberately subverted negotiations on agriculture in Cancún and seems to prefer litigation over negotiation." Connecting cotton to broader global economic changes and the legitimacy of free trade policies to Americans, he warned, "The world [should] begin answering the question as to how long you believe the United States of America can keep buying \$540 billion from you every year . . . without the law of economics taking over, or politics".⁷⁴ Robert Zoellick, U.S. trade representative for the Bush administration, testified, "I want to assure this committee . . . that we are going to fight to defend U.S. agricultural interests, regardless of the forum, whether it be litigation or negotiation".⁷⁵

Divergent visions for the WTO were put forward alongside the legal and technical arguments. From Brazil's perspective, absent reform to agricultural policies in the United States, the WTO risked losing legitimacy as a rule enforcer for international trade.⁷⁶ Brazilian policymakers, especially at the CGC, hoped that the DSB offered an alternative to stalled multilateral negotiations as a way to enforce reforms. From the perspective of policymakers in the United States, however, the WTO was contributing to a dilemma in the political economy of free trade. In particular, as the United States reduced import tariffs, its trade balance suffered and entire sectors saw employment drop precipitously. Although arguments in congressional hearings regarding adherence to WTO rules were

⁷² *US – Cotton*, *supra* note 56, at A10-A14, B10-B17.

⁷³ SCHNEPF, *supra* note 67, at 3.

⁷⁴ U.S. H.R., COMM. ON AGRIC., 108TH CONG., AGRICULTURAL TRADE NEGOTIATIONS, Serial 108-29 (Apr. 28, 2004 & May 19, 2004), at 1-2, 76.

⁷⁵ *Id.* at 16–17.

⁷⁶ Shaffer et al., *supra* note 55; Interview with Pereira, *supra* note 61.

disingenuous on their face, they pointed to a dominant domestic perception that the United States had led the world in advocating for free trade and had sacrificed manufacturing interests in favour of international economic growth. Rather than give the United States a break in agriculture, rising countries like Brazil now were demanding additional painful policy adjustments, through a judicial process dominated by non-U.S. interests.

D. Contesting the Cotton Model

An econometric model used to quantify general market distortions and direct costs to Brazilian farmers from U.S. agricultural subsidies quickly became a focal point of the dispute. Dispute settlement panelists, none of whom had a background in *agricultural* economics, thus found themselves ruling on technical issues with broader policy ramifications. The dispute unfolded in three stages: first, a technical fight over cotton supply and demand elasticity; second, a dispute over the existence of a world “market” and “price” for cotton; and third, questions of access to the core model and protected information about farms and farmers. With some overlap, filings by the United States and responses by Brazil unfolded in a sequence that started with assumptions embedded in the model, then considered the relationship of the model to the real world, and then addressed deeper issues concerning the basis for econometric knowledge-claims.⁷⁷

In 2001, when Brazil’s cotton trade association and the foreign ministry’s trade dispute office grew aware of rising U.S. cotton subsidies, they contacted Daniel Sumner, an agricultural economist at the University of California, Davis. Sumner earned a Ph.D. in economics from the University of Chicago and had worked for the USDA for over a decade, where he supervised economics and statistics departments. On behalf of Abrapa and CGC, Sumner employed a model developed at the Food and Agricultural Policy Research Institute [FAPRI], a joint program of Iowa State University and the University of Missouri-Columbia. With government funding, FAPRI develops multi-year projections for the U.S. agricultural sector and international commodity markets, “grounded in a series of assumptions about the general economy, agricultural policies, the weather, and technological change”.⁷⁸ Since its origins in 1984, FAPRI has developed and updated models for dairy, ethanol, grains, livestock, oilseeds, and sugar. Initially, the model was based on 171 equations; by 2004 it had expanded to over 800

⁷⁷ Sociologists examining scientific disputes have identified a similar sequence when finding that closure is achieved through social and political mechanisms, not via additional experimentation. See HARRY M. COLLINS, *CHANGING ORDER: REPLICATION AND INDUCTION IN SCIENTIFIC PRACTICE* 90-96 (Sage 1985).

⁷⁸ FOOD & AGRIC. POL’Y RESEARCH INST., ABOUT FAPRI, <http://www.fapri.iastate.edu/about.aspx>.

equations that calculated biological and economic relationships within a particular commodity (e.g., corn acreage planted relative to corn prices) and among commodities (e.g., the relationship of dairy cow numbers to feed prices, or shifts in planted acreage of soybeans, wheat, or other crops relative to corn prices).⁷⁹

Sumner used the FAPRI model to develop “counterfactual scenarios” for global cotton output, consumption, and prices with and without major U.S. subsidy programs.⁸⁰ To account for delays between planting and harvesting (and shipping to international markets), he introduced a one-year time lag between subsidy and market impact. Sumner carried out a sequence of steps: first, modelling the supply effects of removing each of the subsidies; second, putting the changed U.S. supply (which shrank in the absence of subsidies) into a simulation model of global cotton supply and demand; and third, calculating rising world market prices (a consequence of reduced U.S. production), modelling the response by suppliers in other countries, and figuring in the resulting mitigation of price increases. For cotton specifically, the FAPRI model measured demand based on domestic data from a variety of purchasers, notably cotton mills. To resolve missing data, Sumner’s estimates included an adjustment – a residual equal to world exports minus world imports – that ensured world demand equalled world supply. Sumner’s adjustment was the same as a longstanding FAPRI method of determining the market-clearing price for any particular commodity by setting supplies to equal demand. Of importance in the WTO dispute, the FAPRI model did not use U.S. exports as an input measure to generate supply-side changes, but instead calculated them as the difference between domestic production and domestic consumption. Sumner reported his findings to Brazilian officials, who cited them directly in WTO filings.

⁷⁹ FOOD & AGRIC. POL’Y RES. INST., DOCUMENTATION OF THE FAPRI MODELING SYSTEM 3 (2004).

⁸⁰ Daniel A. Sumner, *Boxed In: Conflicts Between U.S. Farm Policies and WTO Obligations*, 32 CATO TRADE POL’Y ANALYSIS 9 (Dec. 5, 2005), <http://www.cato.org/publications/trade-policy-analysis/boxed-conflicts-between-us-farm-policies-wto-obligations>.

Table 1. Elasticity Calculations at the Centre of the Brazil – United States Cotton Dispute

Parameter	Brazil's WTO Claim	United States FAPRI Elasticity
U.S. cotton supply elasticity	0.80	0.21
Rest of World cotton supply elasticity	0.20	0.33
U.S. cotton demand elasticity	-0.20	-0.82
Rest of World cotton demand elasticity	-0.20	-0.39

Source: WTO, "United States – Subsidies on Upland Cotton: Recourse to Arbitration by the United States", WT/DS267/ARB/2 (August 31, 2009), at 41

In December 2003, nine months after the DSB panel was established, the U.S. government presented alternative supply and demand elasticity figures to the WTO (see Table 1).⁸¹ The U.S. government relied on economists at the USDA and Bruce Babcock, an agricultural economist at the Iowa State University Centre for Agricultural and Rural Development, for technical arguments. Both sides calculated supply elasticity in the same way, namely as a ratio of the percentage change in acreage planted to the percentage change in price. Under Sumner's calculations on behalf of Brazil, farmers in the United States would plant 8 percent more acreage if the price increased by 10 percent. He arrived at this figure by first incrementally removing each of the six contested subsidy programs and calculating the subsequent decrease in planted area, production, and subsequent exports. In a second step, he derived the supply elasticity from producers' responses to the subsidy programs. U.S. farmers, in Brazil's arguments to the WTO, reacted strongly in the short-term to announcements of new subsidies or to their removal. Farmers in the rest of the world, by contrast, did not receive subsidies and instead responded directly to market signals. According to Brazil's claim, farmers worldwide reacted in the opposite direction from U.S. farmers to the "shocks" induced by the contested subsidy programs.⁸²

The United States countered that Sumner's values were too high, considering that many of the USDA subsidies were of short-term duration and not announced far enough in advance to shift production significantly.⁸³ While conceding that farmers would adjust crop output based on price changes over the long term, the United States argued that in the short term, the supply elasticity was far smaller.

⁸¹ Comments of the United States of America Concerning Brazil's Econometric Model, *United States – Subsidies on Upland Cotton*, WT/DS267/R (Dec. 22, 2003) [hereinafter Comments of the US].

⁸² Daniel A. Sumner, WTO Secretariat, *A Quantitative Simulation Analysis of the Impacts of U.S. Cotton Subsidies on Cotton Prices and Quantities*, WT/DS267, Annex I (Sept. 9, 2003) [hereinafter *Impacts of U.S. Cotton Subsidies*].

⁸³ Comments of the U.S., *supra* note 81, ¶¶ 40-46, 51.

Turning to specific subsidies, the United States defended decoupled payments, crop insurance, and export credits as having a far lower effect (or none at all) on farm production. The U.S. government also calculated that farmers in other countries had higher supply elasticity than in Brazil's claim, based on modelling domestic farmer responses to subsidies and then anticipating how farmers elsewhere responded to the new equilibrium point. The proper question for analysis, according to the United States, was the price of cotton in the absence of subsidies, not how producers would react before the equilibrium point was reached.

Disagreement over demand elasticity followed directly from questions of how farmers respond to price signals. Under Sumner's model, worldwide cotton demand would drop by 2 percent for each 10 percent price increase.⁸⁴ Brazil identified several specific subsidy programs that reduced the net price paid by buyers of U.S. cotton and therefore influenced demand. At the same time, Brazil claimed that end consumers, who were not especially sensitive to the price of raw cotton, were the primary determinants of cotton demand. The United States, by contrast, argued that demand varied considerably around the world and independent of subsidy programs. U.S. cotton mills, the primary purchasers, were sensitive to even small moves in price. At the same time, the rest of the world – dominated by China and other east and south-east Asian clothing producers – was less price sensitive. Nevertheless, the U.S. model estimated demand response at nearly double that of Sumner's analysis. Without explicitly arguing the point, the United States implied that price volatility was the most important risk posed to cotton growers. By reducing volatility through subsidies, the United States was contributing to lower demand variation. Manufacturers could then plan on longer time frames, to the benefit of the farmers that produced cotton.

Overall, according to U.S. filings to the WTO, Brazil's claims exaggerated the effects of U.S. agricultural policies. In the real world, supply and demand curves were slower to equilibrate in response to subsidy programs. While not disputing the rational actor underlying the FAPRI model, the United States was in effect arguing that Brazil believed in an unrealistically fast response by farmers to market forces. The United States' calculations for low domestic supply elasticity but large demand elasticity together supported its argument that subsidies were not distorting world markets. Likewise, calculations of a higher supply elasticity and larger demand elasticity in the rest of the world relative to Brazil's figures reinforced the argument that U.S. subsidies had little effect on international prices and therefore did not hurt cotton growers in Brazil. When rebutting the U.S. arguments, Brazil asserted that considering only long-run equilibrium points would

⁸⁴ *Impacts of U.S. Cotton Subsidies*, *supra* note 82, at 33.

ignore large adverse effects caused throughout the adjustment process.⁸⁵ Rather than wait for a final outcome, the WTO should weigh farmer and consumer behaviours from the time subsidies were put into place.

Sumner's views on subsidies, which were central to Brazil's arguments to the WTO, thus contrasted with those of his former colleagues at the USDA and the U.S. government more generally. He later expounded on the issue at greater length in a review essay of the agricultural economics literature.⁸⁶ Historically, observational and empirical studies had led economists to support subsidies as a solution to the classic "farm problem" of seasonal variability in prices and the risks posed by crop failure. According to Sumner, by the 1980s most academic economists considered a variety of market-based hedging and other financial instruments as less distortionary to the economy, sufficient to address seasonal price variability, and a way to reduce the costs of crop failure for farmers and consumers.⁸⁷ Yet commodity price spikes and crashes continued and remained a topic of dispute, with economists and policymakers divided between supporters and opponents of subsidies. Arguments concerning the relationship of subsidies to crop price variability that remained unresolved after decades of observational and modelling research in the economics discipline thus confronted DSB panel members responsible for the cotton dispute.

The DSB panel worked to make sense of the underlying economic arguments put forth by Brazil and the United States. Notably, the panel first sought to narrow the terms of dispute regarding supply and demand elasticity before articulating key decisions. Panelists thus held: "In the context of the argumentation of the parties, the concepts of short-run and long-run relate to the process of economic adjustment arising from the exogenous change in the economic environment."⁸⁸ Turning to the cotton dispute specifically, the panel observed that exogenous factors were principally the presence or removal of U.S. subsidies. Noting the challenges facing farmers outside of the United States – especially information access and high switching costs among crops – the DSB panel ruled in favour of Brazil's short-run elasticity:

⁸⁵ Recourse to Arbitration by the United States, *United States – Subsidies on Upland Cotton*, WT/DS267/ARB/2 (Aug. 31, 2009), at 38 [hereinafter US – Recourse to Arbitration].

⁸⁶ See Daniel A. Sumner et al., *Evolution of the Economics of Agricultural Policy*, 92 AM. J. AGRIC. ECON. 403 (2010).

⁸⁷ Bruce Gardner, *Why Experts on the Economics of Agriculture have changed their Policy Tune*, in *THE ECONOMICS OF AGRICULTURE* 225 (John M. Antle & Daniel A. Sumner eds., Univ. of Chicago Press 1996).

⁸⁸ US – Recourse to Arbitration, *supra* note 85, at 38.

Producers in the rest of the world are not able to immediately and fully profit from the increase in the world price of cotton ... Using long-run elasticities, which assumes that all adjustments have been completed (or that there are no adjustment costs), will underestimate the adverse effects of the measures.⁸⁹

Brazil's supply and demand elasticities thereupon became the basis for the panel's rulings and the foundation for compensation claims.

As a second line of defense, the U.S. government challenged how Brazil arrived at specific costs to Brazilian farmers and disputed calculations of a global price depression from U.S. subsidies. Adopting a somewhat post-modern argument, the United States suggested there was no such thing as a universal product, "cotton", or a "world market" for cotton. Instead, cotton varied by quality and types of uses and every country had its own markets with price variation. Then the United States insisted that Brazil specify the "subsidized product" for each of the kinds of subsidies that were harming its domestic growers.⁹⁰ Likewise, the United States argued that the AoA reference to price effects "in the same market" required Brazil to identify the "particular domestic market ... in which price effects are alleged to have occurred".⁹¹ The panel ultimately consistently ruled against these arguments. When doing so, the panel members provided definitions of cotton based on USDA grading methods, cited dictionary or other common definitions of "price" and "price suppression", and interpreted the AoA text on "same market" as distinct from any particular geographic area.⁹²

As a third tactic, the United States warned that Brazil's WTO dispute claim "does *not* provide the model itself, including detailed specification of the equations therein. As a result, Brazil is essentially asking the Panel and the United States to accept Dr. Sumner's results on faith alone".⁹³ In response, Brazil observed that the model was developed using U.S. government funding and the full "electronic version of the model was available for use by the United States Government upon coordination with FAPRI staff".⁹⁴ Aligned to the request for the model itself, the United States also argued that because Sumner had not retained the original

⁸⁹ *Id.* at 39.

⁹⁰ *US – Cotton*, *supra* note 56, at 288. References here and below are taken from the final panel report, which incorporates prior filings and extensive direct quotes from materials submitted to the WTO panel by Brazil and the United States in the course of the dispute.

⁹¹ *Id.* at 290.

⁹² *Id.* at 291-95.

⁹³ *Id.* at 28, emphasis in original.

⁹⁴ *Id.* at 29.

outputs of his work, it was impossible to evaluate his use of FAPRI.⁹⁵ In a sequence, potentially leading to repetitive circular arguments, the United States warned that its economists could not replicate Sumner's findings and therefore could not fairly evaluate the price impacts claimed by Brazil. Disputing that Sumner's work was even based on the FAPRI model, the United States further argued, "Dr. Sumner's economic analysis cannot serve as a basis for any findings on the effect of challenged U.S. subsidies".⁹⁶

The DSB issued an interim ruling late 2003 concerning access to the FAPRI model and the basis for Brazil's quantitative claims.⁹⁷ Panel members defined which data and analysis would be used to make decisions, thereby undermining attempts by the United States to create a loop in which key economic claims made by Brazil were weakened by questions about their empirical or epistemological foundations. Specifically, the DSB stated: "The Panel will assess the reliability and relevance of the FAPRI model on the basis of the evidence presented to it by the parties."⁹⁸ Materials not filed in official briefs would not weigh on panelists' decisions. At the same time, the panel expressed frustration concerning U.S. demands for access to the model, noting: "We say that the U.S. has all of the information (i.e., both the FAPRI model and Brazil's information) ... because Brazil itself has never had access to all of the data comprising the FAPRI model ... FAPRI has made all of the information available to the U.S. Why it had done this in the case of the U.S., but not Brazil, relates to the relationship (commercial and otherwise) between FAPRI (which receives U.S. funding for its work) and the U.S. Government. FAPRI has provided all of the information to the U.S. on the express stipulation that the model not be provided to the Panel or Brazil."⁹⁹ Panel members thus avoided a potentially unsolvable dilemma for the WTO of defendants gaining the right to unpack every assumption underlying complex econometric models. While beneficial to Brazil's claims, the WTO panel ironically narrowed FAPRI as a closed input - output model even as the parties to the dispute were opening it to critical inquiry.

In a flurry of briefs, formal requests, and counter-arguments in December 2003 and January 2004, questions of privacy and data access came to the fore even while both countries continued to dispute supply and demand elasticity. The United States requested additional proof of distortions caused by direct payments and counter-cyclical subsidies. In response, Brazil argued that it could do no better than macro estimates without farm-specific identifiers that would make it possible

⁹⁵ Comments of the US, *supra* note 81, at 1.

⁹⁶ *Id.* at 2.

⁹⁷ *US – Cotton*, *supra* note 56.

⁹⁸ *Id.* at 31.

⁹⁹ *Id.* at 30.

to match payments to farms with subsequent harvest data. Brazil revealed that the USDA had provided such information for rice following a Freedom of Information Act request filed by one of its consultants. The United States, however, informed the DSB panel that rice data had been released in error and requested “Brazil and its agents return all copies of the erroneous rice release”.¹⁰⁰ By implication, any similar data for cotton was also considered private. The DSB thereupon requested that the United States release the information, allowing for privacy by assigning anonymous numbers to each farm. The Panel warned, “A refusal by the United States to provide the information as requested without an adequate explanation may lead to adverse inferences being drawn”.¹⁰¹ Responding to the panel, the U.S. government explained that releasing farm-specific planting information would violate the Privacy Act of 1974.¹⁰² Brazil rebutted with an alternative interpretation and case precedents within the United States concerning the Privacy Act before observing that under WTO accords, member states could not invoke domestic laws to avoid complying with the dispute process.¹⁰³

The U.S. strategy to demand the computer code and equations for Brazil’s econometric analysis – and access to underlying data that Brazil could not provide – ran into a roadblock as the WTO panel began to deny U.S. requests. Panel members called on experts hired by both parties to explain their simulations and present findings concerning the link between subsidies and general market distortions as well as specific costs to Brazilian cotton growers. When ruling on the specific issue of access to the model, the panel excoriated the United States for demanding that Brazil provide the FAPRI model to the U.S. government when Brazil did not have access to the underlying data, explanations of key assumptions, and details of formulas that made up the model. While the ruling adopted measured tones, the panel was clearly irritated by the sequence:

While Brazil instructed the organization which owned and operated the model (FAPRI) as to the modifications and adaptations that Brazil believed needed to be made to produce the econometric results presented to the Panel, Brazil could not itself autonomously check the use of those modifications and adaptations. When the United States asked to be able to analyze the model and its workings, FAPRI stipulated that neither Brazil nor the Panel could have similar access.¹⁰⁴

¹⁰⁰ WTO Secretariat, *Letter from the United States*, WT/DS267/R/Add.3, Annex K 37 (Dec. 18, 2003), at K-66.

¹⁰¹ WTO Secretariat, *Panel’s Supplementary Request for Information*, WT/DS267/R/Add.3, Annex L (Feb. 3, 2004), at L-71.

¹⁰² WTO Secretariat, *Answers of the United States of America to the Panel’s Additional Questions*, WT/DS267/R/Add.2, Annex I-18 (Feb. 11, 2004), at I-664.

¹⁰³ WTO Secretariat, *Brazil’s Comments on U.S. 11 February Comments*, WT/DS267/R/Add.2, Annex I-22 (Feb. 18, 2004), at I-734.

¹⁰⁴ *US – Cotton*, *supra* note 56, at 285.

Overall, the panel report emphasized “procedural fairness between the parties” even as the panel members sought to avoid criticism of their own lack of experience with agricultural econometric modelling: “we observe that the simulations were prepared by experts and explained to the panel by experts.”¹⁰⁵

Both parties to the dispute thus invested considerable resources into deconstructing one another’s claims, first disputing assumptions about supply and demand elasticity, then debating the conceptual basis for considering international markets to be real, and finally engaging in tit-for-tat demands about access to underlying data. As a consequence, the FAPRI model itself was opened to critical scrutiny. Furthermore, as experts were called to testify, the basis for their claims on behalf of Brazil or the United States were probed, i.e., whether an empirical observation or a probabilistic forecast could be based on an econometric model. On the other hand, certain issues were deemed out of bounds to the dispute. For example, the background and composition of the panel itself was not raised as a concern by the United States or Brazil. Likewise, the disciplinary training, publication records, and work experience of the experts who testified to the panel were not challenged in order to undermine their credibility. Nevertheless, the cotton dispute came to hinge upon a set of unobservable counterfactuals as modelled by Brazil and the United States. What appeared to be technical questions of supply and demand elasticity were also deeply political choices about agricultural subsidies in the United States and the relationship of domestic laws governing data access to the international adjudicatory role of the WTO.

E. Rulings, Appeals, and Closure

The dispute panel issued a wide-ranging but detailed 351-page ruling in September 2004, finding generally that U.S. cotton policies had “result[ed] in serious prejudice to Brazil’s interests in the form of price suppression in the world market”.¹⁰⁶ Significantly, the panel held that the AoA peace clause did not preclude the WTO from considering Brazil’s claims against the United States under other GATT agreements. The panel therefore ruled: “The issue of fulfilment of the conditions of Article 13 of the Agreement on Agriculture is to be resolved using generally applicable DSU [Dispute Settlement Understanding] rules and procedures.”¹⁰⁷ Having established their standing, panel members found that none of the U.S. domestic support programs cited by Brazil were protected by the peace clause and that all fell under the purview of the AoA.¹⁰⁸ Next, the DSB held that even expired programs were eligible for claims concerning distortionary price

¹⁰⁵ *Id.*

¹⁰⁶ *Id.*

¹⁰⁷ *Id.* at 23.

¹⁰⁸ *Id.*

impacts during their duration.¹⁰⁹ The panel report especially singled out production flexibility contract payments and direct payments as violating WTO “green box” subsidies. Furthermore, most of the export credit guarantees and the Step 2 payments were declared export subsidies in violation of the AoA. The panel report concluded that the United States must “bring its measures ... into conformity with the Agreement on Agriculture”, including the removal of subsidies within six months.¹¹⁰

After the United States appealed the DSB panel ruling, an appellate body held in 2005 that price-contingent subsidies (marketing payments, market loss payments, and countercyclical payments) acted to suppress international prices and that domestic support measures, including production flexibility contracts and direct payments, violated the AoA. The appellate body also found that export credit guarantee programs were not exempt from the AoA. The ruling included specific deadlines for the removal or modification of U.S. subsidies. Despite several changes by the U.S. Department of Agriculture in 2005 and 2006, notably elimination of Step 2 payments, Brazil requested evaluation by a WTO compliance panel. According to Brazil’s analysis, the United States continued to provide subsidies to cotton producers worth \$3 billion annually. The WTO’s compliance panel ruled in December 2007 that the United States had acted inconsistently to phase out prohibited subsidies and countervailing measures.¹¹¹

Following another round of appeals regarding U.S. compliance with the 2004 panel ruling, WTO arbitrators ruled in August 2009 that Brazil could impose \$147.3 million in countermeasures annually, reduced from Brazil’s request for \$1.037 billion.¹¹² Demonstrating the significance of the dispute over supply and demand elasticity, arbitrators used Brazil’s figures to calculate the global adverse effects of U.S. subsidies and apportioned Brazil’s retaliation to its 5.1 % share of world cotton production.¹¹³ For only the second time in its history, the WTO approved cross-sector retaliation, including on intellectual property and services.¹¹⁴ After domestic consultations, Brazil’s foreign trade office, (Câmara de Comércio Exterior, or CAMEX), published a list of 102 products imported from the United States that would face higher tariffs, including cotton, pharmaceuticals, automobiles, and electronics. In mid-March 2010, CAMEX also proposed

¹⁰⁹ *Id.* at 18–27.

¹¹⁰ *Id.* at 350.

¹¹¹ US – Recourse to Arbitration, *supra* note 85, at 2.

¹¹² Brazil claimed adverse effects valued at \$3.335 billion, but asked the DSB for \$1.037 billion in countermeasures. *See* US – Recourse to Arbitration, *id.* at 12, 101.

¹¹³ US – Recourse to Arbitration, *id.* at 50–52.

¹¹⁴ In 2000, the WTO authorized cross-sector retaliation for Ecuador against the European Union in a dispute concerning banana imports. The dispute was resolved without retaliation or direct payments.

intellectual property retaliation measures: shortening patent and copyright terms on movies, software, and pharmaceuticals and other chemicals; permitting Brazilian firms to use intellectual property without the patent holder's consent or remuneration; suspending laws prohibiting importation of infringing products; and creating a special intellectual property registration tax.¹¹⁵ The move was controversial, even within Brazil, where some firms worried that it would set a precedent for weaker patent enforcement.¹¹⁶

Facing the combined threat of higher tariffs on exports and undermining of intellectual property, the Obama administration sought a negotiated solution. In June 2010, the U.S. government signed an agreement to provide \$147.3 million annually as technical assistance to Brazil's cotton sector while pledging to avoid trade-distorting cotton subsidies in the next farm bill.¹¹⁷ After eight years of WTO adjudication, Brazil could claim success. Brazil's trade minister, Miguel Jorge, explained: "The dispute helped the WTO system, since it demonstrated that developing countries can win if they have a properly prepared case."¹¹⁸ By early 2011, the Brazilian cotton industry had established a new organization, the Instituto Brasileiro do Algodão, to manage the largest international compensation payments in WTO history. As the 2012 farm bill entered congressional hearings, U.S. representatives were in regular communication with the government of Brazil.

The WTO has long confronted a challenge to its legitimacy from the perception that it serves the interests of the United States and European countries over those of poorer developing nations.¹¹⁹ Through the DSB's expanding procedural and juridical function, the institution of free trade gained stability during the 2000s, even as other aspects of trade negotiations stalled. In effect, the WTO is building a body of common law through cumulative rulings and institutional order through DSB panel proceedings. In the case of the cotton dispute and the significant precedent it created, the world's leading agricultural

¹¹⁵ GOV'T OF BRAZ., CHAMBER OF EXTERNAL TRADE, U.S. COTTON DISPUTE (Mar. 15, 2010). www.brasilemb.org/press.

¹¹⁶ Sandra Leis, *How Is the Threat of Trade Retaliation Affecting U.S.-Brazil Ties?*, INTER-AMERICAN DIALOGUE - LATIN AMERICA ADVISOR, Mar. 2, 2010, available at: <http://www.dannemann.com.br/site.cfm?app=article&dsp=article&pos=1.3&lng=en&grp=3&num=2378>.

¹¹⁷ SCHNEPF, *supra* note 67, at 1-2; U.S., *Brazil Agree on Framework Regarding WTO Cotton Dispute*, OFFICE OF THE U.S. TRADE REP. (June 17, 2010), <http://www.ustr.gov/about-us/press-office/press-releases/2010/june/us-brazil-agree-framework-regarding-wto-cotton-disput>.

¹¹⁸ Interview with Miguel Jorge, Minister of Development, Industry and Foreign Trade, Brasília (Aug. 11, 2010).

¹¹⁹ G. JOHN IKENBERRY, *AFTER VICTORY: INSTITUTIONS, STRATEGIC RESTRAINT, AND THE REBUILDING OF ORDER AFTER MAJOR WARS* (Princeton Univ. Press 2001).

power was bound by rules it helped to write. In Brazil, the outcome was reported as a strategic victory of a long-term investment in the WTO dispute process and an economic victory for agri-business. In the United States, the cotton dispute perhaps unavoidably played into the hands of critics of multilateralism and weakened the WTO's popular standing. A television advertisement by the American Association of Retired Persons [AARP] in mid-2011 thus held, "If Congress really wants to balance the budget, they could stop spending our money on things like a cotton institute in Brazil".¹²⁰ Nevertheless, confronted with either adhering to the DSB's rulings or abdicating on deep WTO commitments, the United States made domestically controversial commitments to reform agricultural policy.

Underpinning the visible power struggles that attract press, politician, and much scholarly attention, a subtler epistemic dispute played out in the *Brazil – Upland Cotton* dispute. Seemingly uncontested economic principles, for example that subsidies induce farmers to grow more cotton and therefore depress prices, were opened to dispute based on time horizons and complexities of international markets. From narrow technical questions of supply and demand elasticity, the dispute shifted to underlying econometric models and the sources and validity of original data. Closure to the dispute was achieved not through further research and more modelling, but through DSB decisions and international negotiations between the governments of Brazil and the United States. Yet even as the DSB seeks to adjudicate between different epistemic approaches that arise in disputes, it is part of an overall WTO project seeking greater legitimacy by balancing representation of developed and developing countries. These mandates fit together uncomfortably at best.

V. CONCLUSIONS

The idea that all nations will benefit from trade, primarily by specializing in areas of comparative advantage, has deep roots in political economy. Writing in Britain in the midst of the industrial revolution, David Ricardo argued that international trade would promote more efficient allocation of capital and labour and would generate gains to all trading partners through specialization.¹²¹ Contemporary economists have built on Ricardo's theory as a positive description of the world, with analytical models focused to debates over the terms of trade, consumer preferences, and technology and industrial infrastructure in developed

¹²⁰ AARP, *Tell Washington: Stop Cuts to Medicare and Social Security*, www.aarp.org/politics-society/advocacy.

¹²¹ D. RICARDO, *THE PRINCIPLES OF POLITICAL ECONOMY AND TAXATION* 77-93 (J. M. Dent & Sons Ltd. 1911) (1817).

and developing countries.¹²² At the same time, the WTO has undertaken a normative agenda of remaking the world into a global free trade zone. Interestingly, the WTO is not attempting to conceptualize the world as a single entity. Great heterogeneity – diversity of wealth and variation in the production of goods and services – are fundamental to the international trading system. But the WTO is reconfiguring people’s relationships to goods and services by facilitating trade and the consequent conversion of things and ideas into property, including ones previously gifted or kept local. Unsurprisingly, there has been considerable opposition from diverse parties and attendant challenges to the legitimacy of the WTO.

Institutional legitimacy is fundamental to the current era of globalization. In light of a multi-year economic slowdown in the United States and the European Union, domestic dislocations from international trade and debates over industrial policy rank high on policy agendas. At the same time, developing countries continue to question delays in the removal of rich-world agricultural subsidies. Barriers to international capital mobility remain a point of contention on both sides. At the WTO, an important shift has taken place from the strategy of building organizational legitimacy through expanding membership to institutional deepening via the dispute process. As trade disputes grew in significance during the 2000s, a rebalancing of rulings occurred with greater numerical equality between developed and developing countries. Yet, as the Brazil - U.S. cotton dispute vividly illustrates, decisions by the DSB reach deeply into national politics and the resulting contention will inevitably fuel further challenges to the WTO’s legitimacy.

This article suggests that legitimacy is constructed over time. Rather than serving as a fixed metric against which performance is to be judged, legitimacy is better understood as arising out of the interactions among diverse communities who must accept, enact, and enforce the rulings of an organization like the WTO. In turn, novel international organizations are the visible face of underlying institutions like free trade that now affect communities and individuals worldwide. WTO rulings offer a salient set of case studies to examine issues of legitimacy and the exercise of rational power in the contemporary era. Panel reports extract arguments from both sides, cite individual scientific, technical, and economic experts, define technical terms and common phrases found in WTO agreements, and then announce precedent-setting rules. Written in a language of “we”, referring anonymously to the panelists and by implication to the broader WTO membership, rulings are crafted as a voice of reason amidst the divergent economic interests of disputing parties. Rulings play a distinctive functional role in

¹²² Kiminori Matsuyama, *A Ricardian Model with a Continuum of Goods under Nonhomothetic Preferences: Demand Complementarities, Income Distribution, and North-South Trade*, 108 J. POL. ECON. 1093 (2000).

building the juridical authority of the DSB. As a result, I have argued, they also play a significant role in building legitimacy for the WTO.

Associated with the dispute process, the WTO now faces challenges that arise from expert knowledge and testimony in adversarial judicial settings. Thought by the founders of the WTO to be inherently neutral and above challenge, experts instead are subject to dilemmas associated with bias, imperfect fits between the laboratory or an econometric model and the real world, and uncertainty. Once core assumptions are opened to critical scrutiny. A longstanding tenet in the sociology of knowledge holds that expert authority derives not just from individual technical savvy and access to unique methods that unlock underlying principles or rules of nature, but also from processes of constrained scrutiny and the patrolling of disciplinary boundaries.¹²³ As dispute processes open up, otherwise closed, “black boxes” of econometric models, the WTO has become a key site for working out how knowledge claims will be formulated, framed, and validated on the international level.

Modelling, from colonial maps to contemporary econometric forecasts, has a history of use and abuse by imperial powers.¹²⁴ The WTO at its core seeks to structure trade negotiations so that deals are balanced, and to decide disputes so that rulings are not determined solely by the will of the most powerful but instead through procedures and reason. As a result, the WTO now operates as a gatekeeper of acceptable evidence. To maintain this role, it must determine what counts as a valid economic fact, and interpret the relationship of a model to reality. This implies a need to attend to the WTO’s own knowledge-making processes to ensure that they facilitate deliberation without losing credibility. To do so, WTO may soon be compelled to foster greater openness in the dispute adjudication process. A first step would be to accept more amicus briefs and perspectives from non-governmental organizations in the contentious cases.

Perspectives developed here about legitimacy and the WTO also apply to other international institutions in a historical moment in which middle-income and developing countries have impressive growth prospects. A transition in economic power presently underway associated with the rise of the BRICs (Brazil, Russia, India, and China) is still not fully accompanied by changes in representation at multilateral institutions. The WTO cotton case, for example, was associated with a

¹²³ THOMAS F. GIERYN, *CULTURAL BOUNDARIES OF SCIENCE: CREDIBILITY ON THE LINE* 65 (Univ. of Chicago Press 1999); SHEILA JASANOFF, *THE FIFTH BRANCH: SCIENCE ADVISERS AS POLICYMAKERS* 61 (Harvard Univ. Press 1990); Mark E. Warren, *Deliberative Democracy and Accountability*, 90 AM. POL. SCI. REV. 46 (1996).

¹²⁴ BERNARD S. COHN, *COLONIALISM AND ITS FORMS OF KNOWLEDGE: THE BRITISH IN INDIA* (Princeton Univ. Press 1996); BRIAN WYNNE, *RATIONALITY AND RITUAL: THE WINDSCALE INQUIRY AND NUCLEAR DECISIONS IN BRITAIN* (Brit. Soc’y Hist. Sci. 1982).

broader shift for the United States from international price-setter for cotton to one of many price-takers. With domestic consumption falling rapidly in the 1990s and 2000s, even as China's imports boomed, the United States became subject to fluctuations in global markets like other commodity exporters. The initial internal adjustment took the form of subsidies to producers. However, with farm income from subsidies now at risk, thanks to WTO rulings, the United States is entering a more intensified adjustment to global forces, one that it long imposed on others and avoided itself. In this period of domestic and international adjustments, the legitimacy of free trade and of the WTO as an organization is paramount. At the WTO, it is of vital importance not so much to get the facts right (which indisputably is of significance to the credibility of any one ruling), but to design a knowledge-making and adjudication system with legitimacy worldwide. While the WTO appears to be headed in the right direction, the path ahead remains formidable.