

Disembedded Ideologies, Embedded Alternatives: Agricultural Biotechnology, Legitimacy, and the WTO

Mark J. Philbrick, President, Terranet Consulting, Inc., San Francisco, CA

Abstract—Notions of market embeddedness highlight the dependency of markets upon social, cultural, and political infrastructures for their operation and legitimation. In contrast, narrow interpretations of the World Trade Organization (WTO) agreements attempt to enshrine the primacy of free trade, institutionalizing the theoretical abstractions of neoclassical economics in a regime with substantial enforcement power. Though trade restrictions are permitted in order to protect the life and health of humans, plants, and animals, advocates of “free trade” insist that such measures be based on a risk assessment approach that manifests a constrained vision of science. The effort to articulate these disembedded economic and scientific ideologies in binding international law has catalyzed and inflamed public challenges to the legitimacy of WTO rules, processes, and foundational premises.

The current transatlantic WTO dispute over regulations governing the deployment of genetically modified organisms (GMOs) illuminates the crisis of legitimacy at multiple levels. Publics, especially in the EU, are increasingly wary of technologies perceived as posing possible risks to human or environmental health, and of the regulatory and scientific institutions charged with managing these risks. The paper argues that narrow conceptions of risk assessment and management are inadequate to maintain or restore public trust in situations marked by profound uncertainty and a perceived “democratic deficit.” Rather than promulgating the disembedded ideologies that it is seen as exemplifying, this case offers an opportunity for the WTO to embrace expanded and updated definitions of risk assessment and sound science. The threats that GMOs are perceived as posing to the human and natural environment have already engendered widespread protest. Failure to respond constructively would further erode the WTO’s already tenuous legitimacy, highlighting the unsustainability of paradigms that ignore the larger contexts of economic and scientific activity.

Introduction

Theories of neoclassical economics, which have occupied a privileged position of influence over national and international policies since the Second World War, view economic activity as a world unto itself, seeing the social as distinct from ‘pure’ economic abstraction. In contrast, economic sociology views economic activity as intrinsically embedded within the social at the individual, group, national, and cultural levels. Drawing on Durkheim, Weber, and Schumpeter, among others, Swedberg and Granovetter propose three core tenets of ‘new’ economic sociology:

1. Economic action is a form of social action.
2. Economic action is socially situated.
3. Economic institutions are social constructions (1992, 6).

These precepts build on the work of Karl Polanyi, who argued, “the human economy, then, is embedded and

enmeshed in institutions economic and noneconomic. The inclusion of the noneconomic is vital” (1992, 34). The noneconomic, which neoclassical thought relegates to “externality,” is for Polanyi the more primordial, the ground upon which the economic stands, and contingently at that. Rather than existing as divorced abstractions, markets are multifaceted and dynamic forms of social organization that are in turn interlaced with individuals, nations, cultures and conceptions of personal and group identity at multiple levels.

Spillman suggests three foundational aspects of the social construction of markets. She claims that the objects of, parties to, and norms of market exchange all depend on historical and cultural contingencies. Her thesis suggests the possibility of variation over both nations and time, supported by the examples of the resistance to the commoditization of life in the development of the market for life insurance in the U.S., and the differential acceptance of child labor across societies (Spillman 1999). While the objects of exchange might seem self-evident

in a primitive barter economy, modern trading depends upon the enforceable institutionalization of notions such as intellectual property rights, currency exchange, and binding contracts. Likewise, 21st century markets lean heavily on the legalization of corporate personhood, both private and NGO, as well as personal identity standards such as social security numbers to validate actors in market exchange.

Perhaps most critically, markets depend on some modicum of shared norms in order to function effectively. Building on Polanyi's suggestion that economic activity in both 'primitive' and post-industrial societies rests on a combination of reciprocity, redistribution, and exchange, only the last of which is addressed by neo-classical economics, DiMaggio argues that "a minimal commitment to norms of reciprocity and fair dealing is required for markets to operate at all" (1994, 37). While much of the work in economic sociology has focused on social networks and the intersubjective bases of market exchange (Granovetter 1985), social networks are themselves embroiled in, dependent upon, and in some cases contributors to specific political milieus and backdrops of cultural meaning and significance. At the microsocial level, trust and reciprocity play critical roles in the selection and maintenance of business relationships. DiMaggio asserts that shared cultural norms and values facilitate the development of such social capital: "without adding a cultural dimension to structural accounts of embeddedness, it is difficult to understand the negotiated, emergent quality of trust in many concrete settings, and the ability of entrepreneurs to construct networks out of diverse regions of their social worlds" (DiMaggio 1994, 39).

The "invisible hand" does not conjure shared cultural norms and institutions out of thin air. In her discussion of his work, Krippner elegantly summarizes Polanyi's account of the institutionalization of free market ideology in the 19th century, noting the tremendous political investment required to create the conditions for modern markets: "markets, even in ideal form, are not the expression of primal, timeless instincts; they are rather fully social institutions, reflecting a complex alchemy of politics, culture, and ideology" (Krippner 2001, 782). Alchemy is a notoriously variable process, liable to produce divergent results in different settings. Dacin, Ventresca, and Beal invoke cultural and political embeddedness in discussing the possibility of national variation in the legitimacy of market actors and institutions. Reviewing the literature, they find "distinctive institutional logics of action with consequences for the organization of industries and markets" among Europe, Asia, and the Americas, arguing, "Institutional features at the polity level drive patterns of economic activity"

(1999, 322). The construction and operation of international trade institutions requires a delicate balancing act between disparate national economies and more importantly, the often-divergent cultural norms, values, and histories that underlie those economies.

The WTO inherits many of its principles from its predecessor, the General Agreement on Tariffs and Trade (GATT). Finalized in 1947 as part of the Bretton Woods family of institutions, GATT was formulated with a clear memory of the disastrous "beggar-thy-neighbor" protectionist policies of the interwar period. Ideologically grounded in Ricardo's belief that reducing trade restraints increases overall welfare, the GATT assigns "pride of place" (Ruggie 1982, 381) to free trade and market rationality. While it affirmed the desirability of tariff reductions, and established the principle of non-discrimination based on country of origin, GATT also included numerous safeguards and exemptions to allow nations to manage the impact of international liberalization on domestic constituencies. The U.S. resisted many of these exceptions, but acquiesced to the need to balance multilateralism and domestic stability, a compromise that Ruggie terms "embedded liberalism."

Robert Howse traces the postwar evolution of embedded liberalism into an "ideology of free trade" in the hands of an international economic elite. Insulated from the political considerations that underpinned the original bargain, the close-knit network of experts that effectively administered the GATT came to see implementation thereof in strictly economic terms, effectively dropping the "embedded" portion of the bargain (Howse 2002). Aided in the 1980's by conservative administrations in the U.S. and U.K that saw national regulations as vehicles for the payment of "rents" to special interests, momentum towards an agreement with stronger enforcement, expanded coverage, and strict limits on exemptions built among industrialized countries. The Uruguay Round of negotiations concluded in 1994 with the creation of the WTO, embodying a much purer commitment to free trade than did the GATT.

Although the WTO has 600 employees, a budget of just over \$US 130M, and a headquarters in Geneva (WTO 2004), it is more accurately seen as a set of rules and processes serviced by an organization and undergirded by a philosophy of trade liberalization. In addition to the principle of non-discrimination among member states, themes of international harmonization and requirements that national measures minimize their "trade-restrictiveness" pervade the official texts (WTO 1994a). Even allowable trade restrictions are carefully constrained in these terms, e.g. in the preamble to the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS):

“Reaffirming that no Member should be prevented from adopting or enforcing measures necessary to protect human, animal or plant life or health, subject to the requirement that these measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between Members where the same conditions prevail or a disguised restriction on international trade” (WTO 1994b, *italics original*).

The WTO also incorporates new agreements on intellectual property, services, and non-tariff barriers to trade, as well as a binding dispute resolution process. The texts seek to establish the rules for international trade, enshrining a particular set of principles as the norm. To the degree that these principles reflect an excessive emphasis on the abstracted conception of markets as “purely” economic, they are disembedded, and their institutionalization is an attempt to embed disembeddedness as the governing principle of international economic interaction.

It may be instructive to recall that Ricardo developed his theory of comparative advantage, the gospel of free trade, in the context of the mercantilist economies of his day, in which capital was relatively immobile by 21st century standards. Further, he made no attempt to consider distributional effects: even if reduced tariffs increase aggregate wealth, specific individuals and groups may still suffer. The GATT sought to address these and other limitations of economic theory by embedding trade agreements in larger social, political, and cultural contexts. The decomposition of the GATT bargain into a narrow ideology of free trade is a step backwards; the attempt to entrench this idealized vision is not a necessary or desirable evolution but a strategic move in the struggle for control over the institutions upon which global markets depend.

The WTO is a nominally democratic organization: decisions are made by consensus, and each member nation has an equal vote. In practice, however, proposals are negotiated among key parties behind closed doors, and presented to the balance of the membership for an up/down choice. Though countries such as the U.S. have elected governments, trade delegations are appointed, and subject to capture by vested interests (McMichael 2000). Further, while the original treaty required ratification by national parliamentary bodies, such as the U.S. Senate, the WTO agreements were explicitly designed as an all-or-nothing ‘single undertaking’, precluding any possibility of domestic modification. In short, the gap between WTO rules and direct citizen participation is yawning. Combined with the increasing influence of WTO rulings on domestic agricultural, environmental, and consumer policies, accusations of a “democracy deficit” shock little (Verweij and Josling 2003; Woods and Narlikar 2001).

The problems of “regulation without representation” are exacerbated in Europe. In addition to the implicit tension between national and international measures, the EU struggles with a ‘democracy deficit’ of its own. Finding trade policy an especially acute manifestation of the perceived crisis of pan-European institutions, Meunier (2003) separates “process” and “outcome” legitimacy in analyzing the possibility of using the European experience as a model for international governance. Effective democracy, in her view, requires much more than free and fair elections. Rather, both the processes and effects of binding collective decisions have structural, social, and cultural components, and the perceived legitimacy of any given set of institutions or laws entails a complex interaction among all of these factors.

Nanz and Steffek traverse sympathetic ground in their criticism of WTO legitimacy. Suggesting that new conditions require new conceptions, they offer an expanded definition of democracy as “understood as a framework of social and institutional conditions that facilitate the expression of citizens’ concerns and ensures the responsiveness of political power” (2004, 318). Although globalization is not a new phenomenon, the degree and speed of international interconnection and interdependence in the early 21st century exceed that of previous incarnations, presenting new governance challenges. As Dunning argues, the pace of creative destruction of social and relational capital may well lag behind that found within the financial and technological arenas (2000). The evolution of new forms of democratic control, though the process will likely be fitful and time-consuming, is no less important in the development of sustainable societies than more easily indexed indicators. Abstraction and simplification are of great value in multiple domains so long as they are acknowledged as such. Mistaking abstraction for reality, or more egregiously attempting to impose oversimplified abstraction as legislated reality can conflict combustively with social and cultural memories and identities. The transatlantic WTO dispute over agricultural biotechnology is both an explosive example in its own right, and a representative case of the governance struggles likely to characterize the coming decades as global human society attempts to come to grips with the consequences of its self-anointed successes.

Disembedded Complaints

The EU has been less accepting of genetically modified crops than much of the western hemisphere. As of 2002, Europe boasted less than 1 percent of the global hectareage of GM crops, the vast majority of which is in North America (James 2003). After approving a

number of GMOs for either import or cultivation between 1994 and 1998, representatives of five member states announced their intention to suspend any new authorizations, pending the development of new rules specifying labeling and traceability standards for GMOs (Council of the EU 1999). This declaration is known as the *de facto* moratorium, and has been a focus of contention.

The EU moratorium has affected American corn farmers, as Monsanto's Bt Corn has not been approved for human consumption in Europe. In 1997, the U.S. exported roughly 1.6 million tons of corn to Europe, valued at just over \$305M. In 1999, the figure was 12.7 thousand tons, worth \$1.4M (Pew 2003; USDA 2003). Additionally, developing countries such as Zambia have rejected shipments of U.S. food aid partly for fear of contaminating their corn crops, restricting their ability to export to European markets, thus drawing U.S. government ire. After years of public squabbling, the U.S., Canada, and Argentina (the world's leading exporters of GM products) lodged formal complaints against the EU with the WTO in May of 2003. The three cases have been combined, and the parties made their first written submissions to the dispute panel in April and May of 2004.

The complainants allege that the moratorium violates the provisions of the SPS agreement, among others. In particular, they claim that both the moratorium and several specific national import or marketing bans contravene article 8 and Annex C by imposing an "undue delay" in approval procedures. Defining the moratorium as a "measure" covered by the treaty, they assert that it is not supported by scientific evidence, as required by article 2.2, nor based on a risk assessment as specified in article 5.1 and Annex A. Finally, they aver that the EU has applied "arbitrary or unjustifiable distinctions" that have resulted in a "disguised restriction on international trade", contrary to article 5.5 (Canada 2004; United States 2004).

In addition to the formal parties to the dispute, at least two groups have submitted *amicus curiae* briefs to the dispute settlement panel. The authors of the more academic of the two submissions (Winickoff 2004), renowned experts in risk analysis from both sides of the Atlantic, argue that the complainants' case fails to recognize the evolving nature of the science of risk assessment. Recent scholarship, they note, increasingly questions the assumptions of certainty, knowability, absolute objectivity, and exclusive expert judgment implicitly characterized by the complainants, developments that reflect directly on the appropriate interpretation of the standards of sufficient scientific evidence and risk assessment referenced in articles SPS 2.2, 5.1, and annex A. As the EU argues in its response, the "measures" in question should properly be considered under article 5.7,

which allows for temporary measures in cases of scientific uncertainty; the complainants make no meaningful mention thereof (EC 2004).

The briefs further highlight the observation that understandings of risk, risk assessment, and sufficient scientific evidence vary across cultures and among situations. The dynamics of public confidence are also context-specific, underlining the need for differential national consultation styles and schedules. Canada's submission cites a previous Appellate body ruling establishing each (WTO) member's "prerogative" and "implicit obligation" to determine its own appropriate level of protection (Canada 2004, 89). In contrast to the Canadian and U.S. arguments, both *amicus* briefs recognize public participation in the risk analysis process as a necessary element of this determination. The second brief, presented by a diverse international coalition of NGOs, also notes the unique political environment of the EU in advocating against a finding of undue delay (Amicus Coalition 2004). Both briefs also display an understanding that the development of local legitimacy is a critical element of risk assessment, a comprehension sorely lacking in the complainants' documents. Perhaps most strangely, the EU lifted the *de facto* moratorium in May of 2004, issuing its first GMO approval since 1998, yet the U.S. and Canada persist in their case. Though other interpretations are possible, it is not difficult to conceive this dispute action as an attempt to establish binding precedent via an attack on interim procedures that were never designed to withstand WTO challenge, an opportunistic effort to embed disembeddedness.

Towards Embedded Alternatives

Disembeddedness, as discussed so far, might be summarized as the routinized operationalization of simplified abstractions without adequate regard for the complexities of empirical reality, a characterization that nicely captures the attitude toward scientific justification exemplified by the U.S. submission. Winickoff describes the U.S. understanding of risk assessment as "a factually grounded, objective, and value-free analytic exercise requiring (1) precise identification of possible harms to human health and the environment, and (2) use of formal, expert-based assessments of the likelihood of such harms" (2004, 4).

While perhaps sound by Popperian criteria, this approach utterly fails to account for both the inherent limitations of laboratory experimentation in identifying unknown hazards and the social context of risk assessments. The flaws of such an abstract conception

of science parallel those of neoclassical economics; risk assessments, and the science thereof, are inextricably embedded in their surrounding societies. Attempts to enshrine simplified abstractions of issues of cultural importance as the basis for policy decisions are destined to engender political conflict; embedding disembeddedness is not a legitimacy enhancing activity.

Funtowicz and Ravetz's intuition that "the science involved in risk assessments is somehow radically different from that of classical lab practice" (1992, 252) catalyzed their efforts to develop a model for "post-normal" science. In response to what they saw as the glaring omission of considerations of both uncertainty and values in risk assessment, they offer an alternative to the classical definition of risk = hazard * exposure. Noting that assessments of hazard and exposure are subject to both significant scientific contention and variability of public perception in real-life situations, they propose alternative components of risk definition rather than hazard and exposure, their diagram "has as its axes systems uncertainties and decision stakes" (1992, 253, *italics in original*). Situations that score low on both axes fall within the jurisdiction of applied science; problems of moderate uncertainty and medium stakes are amenable to 'professional consultancy', which combines technical knowledge with strong practical experience. When "facts are uncertain, values in dispute, stakes high, and decisions urgent" (1992, 253-4), post-normal science reigns.

Extending Science

Funtowicz and Ravetz's identification of decision stakes as a critical factor grounds their model in everyday reality, and leads directly to the inclusion of non-scientists in risk assessment. Aware of the radicalism of their ideas, they explicitly call for a "new political epistemology of science," one that incorporates both "extended facts" and "extended peer groups" (1992, 252-4). As Wynne points out, the acknowledgement of uncertainty on the part of the scientists provides a critical bridge in facilitating the development of "the hybrid communities necessary for doing the intellectual and political work of building robust multidimensional policies" (Wynne 2001, 3). In discussing his research with hill sheep farmers near the Sellafield/Windscale nuclear complex in the aftermath of Chernobyl, he relates how the scientific culture of control and knowability both decreased the effectiveness of the scientists and degraded their legitimacy with the locals. By insisting on the accuracy of their preconceived radioactivity diffusion models (later proven to be based on improper soil types), and ignoring farmers' comments in designing feeding experiments (which were eventually abandoned for the reasons stipulated by the farmers), the

scientists ignored vital data, and discredited themselves with the very constituency they ostensibly served (Wynne 1989, 1996).

Astutely, Wynne also draws more general conclusions. Arguing for extending scientific "peer groups" in consonance with Funtowicz and Ravetz, he observes how the farmers perceived the scientists' flagrant disregard of their hard-earned wisdom as a threat to their social identity. Carefully privileging neither the farmers nor the scientists, and recognizing the challenges inherent in communicating across divergent frames of reference, he strongly advocates extended peer participation in risk assessment. Wynne's beliefs find some WTO support. In EC-Hormones, the WTO's Appellate Body expressed concern about attempts to constrain the definition of the risk assessment required by the SPS agreement in a narrow scientific straitjacket. In overturning language suggesting that risk assessments must articulate a quantifiable probability of occurrence, the Body stated:

"However, to the extent that the Panel purports to exclude from the scope of a risk assessment in the sense of Article 5.1, all matters not susceptible of quantitative analysis by the empirical or experimental laboratory methods commonly associated with the physical sciences, we believe that the Panel is in error... It is essential to bear in mind that the risk that is to be evaluated in a risk assessment under Article 5.1 is not only risk ascertainable in a science laboratory operating under strictly controlled conditions, but also risk in human societies as they actually exist, in other words, the actual potential for adverse effects on human health in the real world where people live and work and die." (WTO 1998, §172, *italics added*).

Day-to-day practitioners have visceral, real world experiences often otherwise unavailable to laboratory scientists, and the combination of the two perspectives yields a much richer data set for risk analysis. Extended peer groups provide extended facts in support of an expanded political epistemology of science; 'embedded' risk assessment holds forth the possibility of improving empirical quality as well as public legitimacy.

More socially, cases of uncertainty and high stakes create a volatile and often controversial brew; public involvement is essential to capture the multivalent dimensions of risk in such settings. Lay populations tend to emphasize possible consequences in their evaluation, especially irreversible ones (Slovic 1992). More generally, publics across the globe tend to include a much broader set of parameters when contemplating risks than do experts (Renn 1992). Factors typically excluded from professional calculations include whether or not the risks are voluntary, whether those subjected to risks have reasonable access to information about the possible consequences of their

actions, and the degree of culpability of those responsible for managing risky activities, should incidents occur (Marris 2002). Publics also view the trustworthiness of the operating institutions as an essential element of possible risk, rather than an external factor. Characterizing lay people as ignorant, Luddite, or irrational, because their attitudes and opinions fall outside the scope of narrowly conceived risk assessment exacerbates their perception of the threat posed by the relevant institution, further degrading its trustworthiness and legitimacy, and intensifying sensations of danger (Wynne 1992).

Differential Legitimacy

Winickoff emphasizes that risk framings, assessments, and legitimacy are all culturally contingent. Given the importance of the organizations operating and promulgating technologies in public evaluations, differing national perceptions of crucial actors comprise a salient element of risk assessments. In their examination of 1999 Eurobarometer data and 2000 American survey results, Priest, Bonfadelli, and Rusanen (2003) found a strong inverse correlation between the size of the “trust gap” between industry and environmental or consumer organizations and favorable attitudes toward agricultural biotechnology. When industry and environmental groups have similar credibility, as in the U.S., public attitudes tend to be encouraging of GM crops. In countries where environmental groups are seen as substantially more trustworthy than industry, e.g. France and Denmark, support for agbiotech is low. These findings are consonant with Spillman’s (1999) focus on the cultural construction of the objects of and parties to market exchange. In the case of agricultural biotechnology, the legitimacy of the parties is at much at issue as the technologies themselves.

Grappling with trust issues, spawned in part by the Bovine Spongiform Encephalopathy (BSE) crisis and the Belgian dioxin scare, the EU has funded extensive research on public perceptions of science and regulation. One such study, titled “Public Perceptions of Agricultural Biotechnology in Europe (PABE),” employed multiple in-depth focus groups in five countries and several phases, seeking to identify “the underlying factors shaping viewpoints, rather than the viewpoints themselves” (Marris 2002). In contrast to the industry tenet that scientific ignorance drives public resistance, focus group participants based their concerns about GMOs on their experiences with the fallibility of human technological organizations and regulatory schemes, and their acceptance of irreducible uncertainty in risk assessment. Although BSE is often seen as a cause of opposition to GMOs, and participants did make frequent reference thereto, they saw the governmental failures (and initial denials of risk) as exemplary of normal operations, not as

an aberration. Rather than expressing blanket opposition to genetic engineering, focus group members more commonly reacted negatively to the seemingly surreptitious introduction of GMOs into the food supply as common additives without advance notice. Participants also objected to the lack of labeling, the failure of proponents to acknowledge uncertainty regarding unintended consequences, and the mismatch between industry rhetoric about ‘feeding the 21st century’ and the products commercialized to date.

Again, these concerns relate less to the technologies themselves than to the equity of their deployment, and public trust in the deployers. Should the WTO rule against the EU, Europeans would likely perceive a violation of their sovereign ability to determine the legitimacy of participants in their markets as both parties and objects? Given the cultural centrality of food, many may also perceive an affront to their individual and social identities, further stiffening their resistance, and undermining WTO trustworthiness. The EU and its member governments are well aware of their publics’ sentiments – officials have repeatedly cited the need to restore public trust as the rationale for developing new assessment and labeling regulations. Their submission to the WTO argues that the moratorium was necessary in order to allow adequate time to permit sufficient public participation in the formulation of new guidelines, as well as to complete longer-term studies such as the U.K.’s Farm-Scale Evaluations, which measured the impact of entire suites of GMO farming practices on local biodiversity (PMSU 2003). A ruling against the EU would be seen as valuing trade interests over both democratic processes and comprehensive science, further souring European opinion towards both agbiotech actors and the WTO.

Conclusion

The WTO is commonly seen as personifying the negative aspects of globalization. Its commitment to reducing barriers to trade is seen as leveling the playing field in favor of the powerful, and its removal from ordinary citizens has created a profound “democracy deficit” in public eyes. To the degree that a narrow conception of risk assessment continues to infuse its rulings, a disembedded scientific ideology joins the abstractions of neoclassical economics to create a driving philosophy increasingly at odds with market, social, and environmental realities. However, the current transatlantic dispute over biotechnology offers an opportunity for change.

The arguments of the two sides reflect two competing interpretations of the WTO agreements; the

European position manifests a more sustainable view of the appropriate relationships between trade, science, the environment, and society. A finding by the dispute settlement panel and the Appellate Body that the European moratorium falls properly under article 5.7 of the SPS agreement as a precautionary measure in the absence of sufficient scientific evidence would signal a dramatic shift. Though a legislative solution, perhaps a renegotiation of the SPS and related texts to embrace a comprehensive version of the precautionary principle, such as articulated in the Cartagena protocol, and to more explicitly recognize the right of members to establish their own rules of market legitimacy, would be more appropriate in the longer term, a ruling substantially in favor of the EU would constitute a very constructive step. The alternative would further degrade the legitimacy of the WTO, diminishing its effectiveness as citizens demand domestic policies increasingly at odds with a 'pure' ideology of free trade. Markets, and market institutions, are inextricably embedded in the social, cultural, and political; pursuing ideologies that advocate otherwise is a prescription for social collision, and ultimately unsustainable.

References

- Amicus Coalition (2004). European Communities - Measures Affecting the Approval and Marketing of Biotech Products (DS291; DS292, and DS293): Information Submitted to the Panel by Non-Parties (Amicus Curiae Submission), 27 May. Viewed at <http://www.genewatch.org/WTO/Amicus/PublicInterestAmicus.pdf> on 7/7/04.
- Canada (2004). European Communities – Measures Affecting the Approval and Marketing of Biotech Products (WT/DS292): First Written Submission of Canada, 21 April. Viewed at http://www.genewatch.org/WTO/Submissions/Canada_WTO_Submission.pdf on 7/7/04.
- Council of the European Union (1999). Draft Minutes of the 2194th Council Meeting (Environment) held in Luxembourg on 24 and 25 June. Brussels, 9433/99.
- Dacin, M. Tina, Marc J. Ventresca, and Brent D. Beal (1999). The embeddedness of organizations: Dialogue and directions. *Journal of Management* 25(3): 317-356.
- DiMaggio, Paul (1994). Culture and economy. In *The Handbook of Economic Sociology*, ed. Neil J. Smelser and Richard Swedberg, 27-57. Princeton: Princeton University Press.
- Dunning, John H. (2000). The future of the WTO: A socio-relational challenge? *Review of International Political Economy* 7(3):475-483.
- European Communities (EC) (2004). European Communities – Measures Affecting the Approval and Marketing of Biotech Products (WT/DS291, 292, and 293): First Written Submission by the European Communities, 17 May. Viewed at <http://www.genewatch.org/WTO/Submissions/EU%20submission%20to%20WTO.pdf> on 7/7/04.
- Funtowicz, Silvio O. and Jerome R. Ravetz (1992). Three types of risk assessment and the emergence of post-normal science. In *Social Theories of Risk*, ed. Sheldon Krimsky and Dominic Golding, 251-73. Westport, CT: Prager Publishers.
- Granovetter, Mark (1985). Economic action and social structure: The problem of embeddedness. *American Journal of Sociology* 91: 481-510.
- Howse, Robert (2002). From politics to technocracy and back again: The fate of the multilateral trading regime. *The American Journal of International Law* 96(1): 94-117.
- James, Clive (2003). *Global Status of GM Crops: Global Area of GM Crops 2002*. Ithaca, NY: International Service for the Acquisition of Agri-biotech applications (ISAAA). Viewed at <http://www.isaaa.org/kc/Bin/gstats/index.htm> on 10/30/03.
- Krippner, Greta R. (2001). The elusive market: Embeddedness and the paradigm of economic sociology. *Theory and Society* 30: 775-810.
- Marris, Claire, Brian Wynne, Peter Simmons, and Sue Weldon (2002). Public perceptions of agricultural biotechnologies in Europe. Final Report of the PABE Research Project, Funded by the Commission of European Communities. Contract number FAIR CT98-3944 (DG12 – SSMI).
- McMichael, Phillip (2000). Sleepless since Seattle: What is the WTO about? *Review of International Political Economy* 7(3): 466-474.
- Meunier, Sophie (2003). Trade policy and political legitimacy in the European Union. *Comparative European Politics* 1: 67-90.
- Nanz, Patricia, and Jens Steffek (2004). Global governance, participation and the public sphere. *Government and Opposition* Ltd.: 314-335. Oxford: Blackwell Publishing.
- Polanyi, Karl (1992 (1957)). The economy as instituted process. In *The Sociology of Economic Life*, Richard Swedberg and Mark Granovetter, eds., 29-51. Boulder: Westview Press, Inc.
- Priest, Susanna Hornig, Heinz Bonfadelli, and Maria Rusanen (2003). The "Trust Gap" hypothesis: Predicting support for biotechnology across national cultures as a function of trust in actors. *Risk Analysis* 23(4): 751-66.
- Prime Minister's Strategy Unit (PMSU) (2003). *Field Work: Weighing Up the Costs and Benefits of GM Crops*. London: Cabinet Office. Available at <http://www.number-10.gov.uk/su/gm/pdf.htm> as of 12/14/03.
- Renn, Ortwin (1992). Concepts of risk: A classification. In *Social Theories of Risk*, ed. Sheldon Krimsky and Dominic Golding, 53-79. Westport, CT: Prager Publishers.
- Ruggie, John G. (1982). International regimes, transactions, and change: Embedded liberalism in the postwar economic order. *International Organization* 36(2): 379-415.
- Slovic, Paul (1992). Perception of risk: Reflections on the psychometric paradigm. In *Social Theories of Risk*, Sheldon Krimsky and Dominic Golding, Eds., 117-152. London: Praeger Publishers.
- Spillman, Lyn (1999). Enriching exchange: Cultural dimensions of markets. *American Journal of Economics and Sociology* 58(4): 1047-1071.
- Swedberg, Richard and Mark Granovetter, eds. (1992). *Introduction to The Sociology of Economic Life*: 1-22. Boulder: Westview Press, Inc.
- United States (US) (2004). European Communities – Measures Affecting the Approval and Marketing of Biotech Products (WT/DS291, 292, and 293): First Submission of the United States, 21 April. Viewed at <http://www.ustr.gov/enforcement/2004-04-21-ecbiotech-usfirst.pdf> on 6/11/04.

- U.S. Department of Agriculture (USDA), Foreign Agricultural Service (FAS) (2003). Agricultural Export Commodity Aggregations. Sep. 26.
- Verweij, Marco and Timothy Josling (2003). Introduction to special issue: Deliberately democratizing multilateral organization. *Governance: An International Journal of Policy, Administration, and Institutions* 16(1): 1-21.
- Winickoff, David, Lawrence Busch, Robin Grove-White, Sheila Jasanoff, and Brian Wynne (2004). Amicus Curiae Brief Submitted to the Dispute Settlement Panel of the WTO in the case of EC: Measures Affecting the Approval and Marketing of Biotech Products, 30 Apr. Viewed at http://www.genewatch.org/WTO/Amicus/AcademicAmicus_WTO_submission.pdf on 7/7/04.
- Woods, Ngaire and Amrita Narlikar (2001). Governance and the limits of accountability: the WTO, the IMF, and the World Bank. *International Social Science Journal* 170: 569-583.
- World Trade Organization (1994a). Agreement Establishing the World Trade Organization. Viewed at http://www.wto.org/english/docs_e/legal_e/04-wto.pdf on 7/7/04.
- _____ (1994b). Agreement on the Application of Sanitary and Phytosanitary Measures (SPS). Viewed at http://www.wto.org/english/docs_e/legal_e/15-sps.pdf on 7/7/04.
- _____ (1998). European Communities – Measures Concerning Meat and Meat Products (Hormones), Report of the Appellate Body. WT/DS26/AB/R, Jan. 16.
- _____ (2004). The WTO. Viewed at http://www.wto.org/english/thewto_e/thewto_e.htm on 7/8/04.
- Wynne, Brian (1989). Sheep farming after Chernobyl: a case study in communicating scientific information. *Environment*, 31: 11-15 and 33-38.
- _____ (1992). Risk and social learning: Reification to engagement. In *Social Theories of Risk*, Sheldon Krimsky and Dominic Golding, Eds., 275-297. London: Praeger Publishers.
- _____ (1996). Misunderstood misunderstandings: social identities and the public uptake of science. In *Misunderstanding Science? The Public Reconstruction of Science and Technology*, Alan Irwin and Brian Wynne, eds., 19-46. Cambridge: Cambridge University Press.
- _____ (2001). Managing scientific uncertainty in public policy. Background paper for *Biotechnology and Global Governance: Crisis and Opportunity*, Cambridge, MA, Oct. 26-28. Viewed at <http://www.wcfia.harvard.edu/conferences/biotech/Backgroundpapers.html> on 11/25/03.