

Trade Conflict Over Genetically Modified Organisms

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In 2003 the USA, seconded by Argentina and Canada, initiated litigation in the World Trade Organization (WTO) against the European Union's regulatory policy for genetically modified organisms (GMOs). The three plaintiffs claimed that the EU's GMO policy was creating illegal trade restrictions. Specifically, they argued (i) that the EU had implemented a de facto moratorium on approval of new biotech crop varieties; that (ii) the EU had failed to approve some particular GM crops for which US firms were seeking approval; and (iii) that several EU countries were unilaterally banning the import and marketing of GM crops that had been approved at the EU level. The WTO Dispute Settlement Panel's verdict (a 2000 pages document!), issued in September 2006, supports the plaintiffs' position to a large extent and asks the EU to bring its GMO approval process in line with WTO rules. As of December 2007, it appeared very unlikely that the EU would be willing or able to comply with the WTO verdict. The EU's GMO legislation had been overhauled even before the WTO panel issued its verdict. But the EU decision-making process for GMO approvals has remained complex and subject to political considerations rather than scientific-risk assessment alone: it involves the European Food Safety Authority (EFSA), which has an advisory role, as well as the EU Commission and Council of Ministers, which hold the decision-making authority.

Why does the WTO trade dispute on GMOs, one of more than 300 WTO disputes since 1995, deserve a full chapter in this book? We submit that this dispute is interesting because it pits countries with a predominantly GMO-adverse public (Europe) against countries whose GMO policy is driven by large, export-oriented farmers and the biotech industry (primarily the USA, to some extent also Argentina and Canada). These circumstances raise difficult questions with respect to legitimate justifications for trade-restricting environment, health and safety policies. Most European governments and the EU take the position that the precautionary principle (a "better safe than sorry" approach to regulation in the presence of uncertainty about risks posed by GMOs) and the prevailing GMO-skepticism among consumers and voters are sufficient justification for a restrictive policy. The USA, in contrast, claims that WTO rules, particularly those of the Agreement on Sanitary and Phytosanitary Measures (SPS Agreement), mandate a strong "sound science" discipline. From the latter perspective, trade restricting GMO policies are permitted only to the extent they are supported by scientific evidence on risks.

The analytical (positive) and normative issues raised by the transatlantic GMO dispute extend far beyond the dispute itself. Analytically, the GMO dispute raises the question why regulatory policies in the USA and the EU have, over the past 10-15 years, moved in different directions. It will be noted that GMOs is not the only area where this has been the case. Several other environment, health and safety policy issues have followed a similar pattern, e.g., electronic waste regulation, toxic waste trade policy, and climate change policy. From a

normative viewpoint, the GMO dispute raises the question whether science and global institutions with judicial authority (such as the WTO) relying on scientific evidence can be effective arbiters in cases where democratic justifications (what consumers and voters want) do not line up with scientific justifications (risks identified by science). It also raises questions about the consequences the GMO trade dispute between the two biggest economic powers in the global system has for other countries, and poor countries in particular.

The following part of this chapter describes the polarization of regulatory policies for GMOs. In part two we examine why GMO regulations in the EU and the USA have moved in different directions. Part three looks at the WTO dispute on GMOs. In part four we explore the effects on developing countries. In part five we conclude by discussing normative issues and policy-options for moving beyond deadlock.

1. Genetically Modified (GM) Crops and Regulatory Polarization

The first “green revolution” started in the 1930s. It brought rapid yield increases throughout the 1970s in corn and other temperate-climate crops through increasingly effective fertilizers, pesticides, crop species, machinery, and farm management. The average farmer in modern agriculture is thus able to feed up to 30 non-farmers. The second green revolution took place in the 1960s and 1970s: it carried the same technologies to the developing world and crops grown in the tropics (particularly, rice). Genetic engineering in agriculture may lead to a third green revolution, though it is still at an early stage. It emerged in the 1970s and was commercialized in the 1990s. The proponents of this technology claim that it will result in another massive increase in agronomic productivity and also provide qualitative improvements in the food supply (e.g., healthier food).

One of the big differences between the first two green revolutions and the (potentially) third one is that the latter has not been greeted with unqualified enthusiasm. In fact, we have witnessed a process of global regulatory polarization as EU countries have imposed severe regulatory constraints on GMOs, whereas the United States has opened its market to most agri-biotech applications. Other countries have either aligned with one or the other of the world’s two largest economies, or they have been struggling to find some middle ground.

This process of polarization is quite surprising. In the mid-1980s, the GMO policies of West European countries, the United States, and other nations were similar. But at the end of the 1980s, they began to drift apart. From 1990 on, the EU and its member states have turned to ever more stringent approval and labeling standards for GMOs, with strong emphasis of the precautionary principle. The result is that very few agricultural biotech applications have been approved for commercialization in the EU. Commercial planting of GM-crops in EU countries accounts only for a tiny fraction of total crop cultivation. And the number of GM crop field trials is much smaller than in the USA. The number of labeled GM food products on the EU market has approached zero as food processors and retailers have chosen to avoid rather than label GM-foods. The EU’s market for GM-food products has shrunk to GM-food ingredients and animal feed not subject to mandatory labeling.

Policy-makers in the USA have opted for an entirely different approach. They have embraced agricultural biotechnology. They view genetic engineering as a new and innovative food and feed production technology that does not per se make produced food or feed less safe than their conventional counterparts. The US Food and Drug Administration (FDA), the Department of Agriculture (USDA), and the Environmental Protection Agency (EPA) have installed relatively simple notification procedures, have left pre-market risk assessments to industry, and have approved most industry requests for field testing and commercialization of

GM-products very quickly. Producers and/or retailers may voluntarily label GM-foods but are not required by law to do so. While the EU has imposed the (involuntary) burden of labeling on producers and/or vendors of GM-products, the USA imposes the (voluntary) burden of labeling on producers of non-GM products: there is a US market for labeled non-GM products, but not for labeled GM products. More than 60 GM-crop varieties are approved and grown in the USA. Many more GM-varieties have been authorized for field-testing. GM-crop acreage increased dramatically between 1996 and 2007. And GM-ingredients can be found in thousands of processed food products.

These transatlantic differences are associated, at the global level, with an increasing gap between GMO promoting and GMO restricting countries, both in terms of approval and labeling regulation and at the market level. The pro-biotech camp clusters around the USA and includes in particular Argentina and Canada. The other camp clusters around the EU and also includes several non-EU states in Europe, such as Norway, Switzerland, and various Central and Eastern European countries. A quite unique case in this respect is Switzerland, whose citizens approved by large majority an initiative that imposes a five year moratorium (2006-2010) on the commercial cultivation of GM-crops. We will return to this case because it pits fundamental principles of democracy against economic freedom and scientific risk assessment.

Many other countries (e.g., Australia, Brazil, China, India, Japan, Mexico, Russia, and South Africa) have moved towards stricter approval procedures. Many countries (e.g. Australia, China, Japan, South Korea, Russia) have also adopted mandatory labeling requirements for GM-food. These regulations differ very much with respect to their stringency. On average they position these countries somewhere in between the EU and the USA.

Most developing countries have experienced great difficulties in trying to make sense of scientific and political controversies about risks and benefits of GMOs. Many of them have established some regulatory policies, often with the help of experts from industrialized countries. In trying to enact and implement these policies, they have been caught in conflicting pressures by big trading partners (notably, the EU and the USA).

2. Explaining Differences in Regulatory Policy

Popular views on why Europeans are more hostile to GMOs than North Americans center on arguments about general technophobia and nutritional habits (culinary culture). Such arguments are largely wrong. For example, survey results on public attitudes towards technology do not support the claim that Europeans are more technophobic (e.g., Bernauer 2003). Moreover, while the obesity rate in the USA is much higher than in Europe, Europeans smoke more than US-Americans (despite higher cigarette taxes in Europe) (Cutler and Glaeser 2006).

Arguments that, on average, scientific risk assessment and cost-benefit analysis play a greater role in US policy-making are probably accurate. But this claim is too generic to help us in understanding what we observe in the GMO area. Recent research has thus focused primarily on institutional structures, the mass media, consumer perceptions, and NGO and industry behavior to explain regulatory differences (e.g., Shaffer and Pollack 2007; Falkner 2006; Bauer and Gaskell 2002; Russell and Vogler 2002; Gaskell and Bauer 2001; Paarlberg 2001).

Bernauer (2003) explains transatlantic differences primarily in terms of differences in consumer perceptions, activity of non-governmental organizations (NGOs), interests and behavior of biotech firms, farmers, processors and retailers, and institutional characteristics of

the political systems concerned. This explanation takes into account market-processes as well as domestic- and international political processes. The explanation combines two theoretical perspectives. The first views regulation as the result of a struggle for political and market influence among different interest groups within the EU and the United States; i.e., among input-suppliers (agri-biotech firms), farmers, processors and retailers, and consumer and environmental groups. It illuminates why these groups have different preferences, and when and why particular interests prevail in the policy-making process. The second perspective looks at the effect of interactions among political subunits (EU-countries, US-states) in federalist political systems (the EU, the US). The first perspective focuses on societal influences operating from the individual or firm level upward (bottom up). The second centers on the effects of system-wide political structures and institutions (top-down perspective). In the EU, both processes have operated in ways that have driven GMO policy towards greater stringency. In the USA, they have operated in ways that have sustained GMO friendly regulation.

As to the first perspective, Bernauer's (2003) analysis shows that the collective action capacity of environmental and consumer interests has varied substantially between the EU and the USA. This variation can be traced back to differences in public perceptions of agricultural biotechnology, consumer trust in regulatory authorities, and institutional settings. Due to more negative consumer attitudes towards GMOs and lower public trust in regulatory agencies, the collective action capacity of GMO adverse European environmental and consumer groups has been higher than the capacity of their US counterparts. Transatlantic differences in the extent and nature of NGO's GMO campaigns reflect this variation in collective action capacity. GMO adverse groups in Europe have thus been more successful in shaping markets for the technology than GMO adverse groups in the US. Negative public attitudes towards GMOs in combination with more institutional access due to more fragmented (multilevel) policy-making has also enabled GMO adverse interests in Europe to exert more influence on policy-making. In the USA less negative public attitudes towards GMOs and a centralized regulatory system for GMOs have acted against GMO adverse interests.

The collective action capacity of pro-GMO interests has also varied substantially between the EU and the USA. In Europe, negative public attitudes and NGO campaigns have driven a wedge between biotech firms on the one hand and food processors, retailers, and farmers on the other hand. Thus they have reduced the collective action capacity of pro-GMO interests. The pro-GMO coalition in Europe has been crippled not by protectionist "piggy-backing" by some producers (notably, farmers) – a key claim in US attacks on the EU's GMO regulation. It has been weakened because those firms most vulnerable to market pressure spearheaded by NGOs, notably, food processors and retailers, have been pushed towards support for stricter regulation. In contrast, in the USA a cohesive and well-organized pro-GMO producer coalition has prevailed due to more positive public attitudes and weaker campaigns by GMO adverse NGOs. Differences in industrial structure (particularly, higher concentration, both in economic and organizational terms, of the EU than the US retail sector) also play a role in explaining why the pro GMO producer coalition has been much weaker in the EU than the USA.

The interest group explanation does not account for differences in interests and policies of individual EU countries and US states and their implications for variation of policies at the EU and US level. Hence, the second perspective views EU and US GMO policies as outcomes of interactions between political subunits (member states in the EU, states in the US) within a larger (federal) political system where these subunits can to varying degrees act autonomously. It concentrates on whether political subunits within the larger political system can, by unilaterally installing stricter or laxer regulation of GMOs, push the stringency of

system-wide regulations up or down. The analysis of GMO policy-making in the EU and the USA shows that in the EU we observe a substantial “ratcheting-up” effect, whereas “centralized laxity” has prevailed in the United States.

EU countries are bound by supranational rules that guarantee the free flow of agricultural goods within the EU’s internal market. But they maintain considerable national autonomy in closely related policy-areas, such as environment, health and safety regulation. For example: in many areas they have safeguarded the right to establish regulation that is stricter than minimum standards set by the EU or that deviates from the principle of mutual recognition. These conditions apply to agri-biotechnology as well.

When the forces described and explained by the interest group perspective began to drive up the stringency of regulation in more GMO-adverse EU countries, the more GMO friendly nations as well as the EU Commission faced a dilemma: how to satisfy demands, in some countries, for stricter GMO regulation and, at the same time, safeguard the EU’s internal market for agricultural products? Variation across countries in approval and labeling standards for GM-products threatened to disrupt agricultural trade in the EU. In view of strong public support for strict GMO regulation in around half of the EU’s member countries, downward harmonization to levels acceptable to pro-GMO countries was impossible. Pro-GMO countries in the EU have thus regularly caved in to the demands of GMO adverse countries. They have done so because, in their view, the costs of market disruptions are higher than the costs of restrictive GMO regulation. In this “ratcheting-up” process GMO adverse countries have, step-by-step, moved towards more stringent regulations and have dragged EU-wide regulations upward in this process.

GMO policy is more centralized in the USA than in the EU, both in terms of political levels and institutions involved. It is largely in the hands of two independent federal agencies and one federal ministry (FDA, EPA, USDA). What might appear like a paradox in the EU case – that fragmentation of decision-making authority produces upward harmonization and not simply paralysis – does not come into play in the USA to the extent it does in the EU. Bottom-up pressure for stricter regulation has in some cases led to diverging policy-preferences among US states. But due to institutional and legal constraints US states’ options for stricter unilateral regulation of GMOs are much more limited than the options of individual EU countries. Even if public pressure for stricter GMO regulation grew in some US states, and if these states imposed some restrictions that were upheld by the courts, a “ratcheting-up” trend would emerge much more slowly in the USA than in the EU. In other words, relatively positive public attitudes towards GMOs and weak NGO campaigns are primarily responsible for lax GMO regulation in the USA; and federal processes in the USA constitute an additional barrier against stricter regulation should bottom-up pressure increase in future.

3. The WTO Dispute on GMOs

To put the GMO dispute in perspective: WTO trade disputes are extremely rare events. Only around 2 percent of all pairs of WTO member countries (country dyads per year) ever get involved in a WTO trade dispute (Sattler and Bernauer 2007). Of the 300+ WTO trade disputes since 1995, less than ten percent concern environment, health and safety issues (Bernauer and Sattler 2006).

The principal reasons why the USA has opted for escalation in the transatlantic disagreement on GMO policy are primarily the following (Bernauer 2003). First, economic losses due to the EU’s GMO restrictions (estimated to be in the order of several hundred million USD p.a.) are

relatively large and concentrated on politically influential economic actors in the USA (chiefly large, export-oriented farmers and the biotech industry). Also, the US government has worried that other countries that are important export destinations for US agricultural products will follow the EU policy model for GMOs. Second, non-coercive policy measures for solving the problem are difficult or impossible to implement. Mutual recognition is unacceptable to the EU and the USA because it would undermine the legitimacy of both sides' respective policy. Compensation would founder on political legitimacy and financial grounds. All international harmonization efforts are deadlocked for the same reasons that have led to regulatory polarization. The same holds true for unilateral regulatory adjustment in the USA. Unilateral market adjustment in the USA has helped in mitigating trade tensions but can, by itself, not solve the problem. Third, the USA assumed that it would win the case. It also anticipated that the EU would make concessions before a WTO verdict or after a "guilty" verdict, and that other important export destinations for US agricultural goods would thus be deterred from enacting EU-style policies for GMOs.

As noted in the introduction, the US-led plaintiffs won the case. The de facto consequences of the verdict remain open. The EU had initiated reforms of its approval process even before the USA launched the trade dispute. These reforms were completed in 2004 and were meant to end the informal moratorium on approvals of new GM crops (1998-2003). With reference to the EU Commission's position, the WTO verdict is largely running into an open door. The Commission is relatively biotech-friendly and has for the past several years tried to emphasize risk-assessment criteria over political considerations in the approval process, without much success. However, the main problem lies in implementing the EU's revised legislation under conditions of adverse public attitudes towards GMOs and strong resistance of several EU member countries against lifting their unilateral bans on GM crops (six countries at the time of the WTO verdict).

In late 2007 the EU Commission proposed that the unilateral bans must be lifted, but the Council of Ministers failed to support this proposal. Only Italy has lifted its ban. Whether the former or the latter body of the EU will prevail, or whether the issue will be taken to the European Court of Justice remains open. It is also unclear whether new risk assessments undertaken by EU member states that have put in place unilateral bans would make those bans compatible with the SPS Agreement and resolve the WTO dispute. The principal charge in the WTO ruling was that those unilateral bans were not backed up by country-specific risk assessment, and were not supported by risk assessments carried out at the EU level (the EU has been in favor of approving the respective GM crops) (Arcuri 2007, Poli 2007).

In any event, the EU experiences great difficulties in implementing its own GMO regulations and, by implication, also the WTO verdict. The approval process is unlikely to gain the momentum requested by the plaintiffs in the WTO case. Moreover, if the unilateral bans could be supported by country-specific risk assessments, which would presumably make them compatible with the SPS Agreement, this would still not satisfy the plaintiffs. Finally, even if more GM crops were approved and cultivated in Europe they would be greeted by fierce NGO campaigns, less than enthusiastic consumers, and risk averse retailers. And all this would happen in a setting where, according to the law, GM-products have to bear a clearly visible label (EU labeling regulation was not challenged in the WTO case). Hence it appears very unlikely that the WTO verdict will mark the end of the transatlantic trade conflict over GMOs.

In more general terms, a reversal of the EU's GMO policy is unlikely because of low public acceptance of GM-food, low trust in regulators, pressure by NGOs, significant opposition to GM-crops among farmers, strong incentives of food processors and retailers to stay away or withdraw from the market for labeled GM-foods, and institutional inertia in EU policy-making. The dominance of GMO adverse interests in the EU is bolstered by the

characteristics of regulatory federalism in the EU. Decision-making structures in the EU allow GMO adverse minorities to block efforts to relax existing standards. In addition, a combination of multi-level decision-making, substantial regulatory autonomy of EU countries, and concerns about safeguarding the EU's internal market encourage a "ratcheting-up" of GMO regulations rather than downward harmonization.

The USA, for its part, is unlikely to move towards the EU model of GMO policy anytime soon. Potential conflicts between US farmers and biotech firms in view of precarious export opportunities for GM-crops have been reduced through increased government subsidies for US farmers. In addition to low interest group ("bottom-up") pressure for stricter agri-biotech regulation, the characteristics of US regulatory federalism act against more restrictive GMO policies. In the unlikely event that consumer pressure for tighter rules grew, heavily constrained regulatory autonomy of US states in agri-biotech matters combined with centralized decision-making at the federal level would slow down any "contagion" effect that may emanate from individual US states trying to impose more restrictive policies.

4. Consequences for Other Countries

Whether regulatory polarization and transatlantic trade conflict over GMOs will continue and for how long depends not only on domestic processes in the EU and the USA. It also depends on developments at the global level. If most countries other than the USA and the EU moved towards the EU policy model for GMOs, this would create pressure for stricter regulation in the USA. Pressure for more liberal rules in the EU would grow if most other countries moved towards the US model. But for the time being the world's two largest economies are clearly the principal drivers of worldwide regulatory activity on GMOs. Their policy-choices limit the options of other countries, particularly those that are economically dependent on the EU, the USA, or both. Switzerland, Norway, and Central and Eastern European countries have thus aligned with the EU, Canada with the USA. Other countries, which are less dependent on EU or US markets, e.g., China, Brazil, India, Japan, and Russia, have adopted regulations whose stringency lies somewhere in between the EU and the US model. GMO policy in these countries is very recent and very much in flux. Both the EU and the USA have been battling for influence on the regulatory policies of these countries.

In the overall picture, the welfare implications (at the national, not the individual level) of restricting or promoting GM-crops in rich, industrialized countries are quite limited. There is no compelling need to increase agricultural productivity and the nutritional value of food in rich countries. The most important benefits (offered only in minor ways by current generation GM-crops, but potentially by future GM-varieties) may come from reduced fertilizer and pesticide use and improved soil and water conservation. However, the biggest gains from GMOs in rich countries are likely to materialize in medical and industrial applications. The needs of many developing countries are very different. They are plagued by low agricultural productivity, rapid population growth, food insecurity, and (related) disastrous levels of soil degradation and deforestation. Appropriate GM-crops could contribute to the mitigation of these problems (Brookes and Barfoot 2006; Cohen and Paarlberg 2004; Conway 2005; Victor and Runge 2002).

Unfortunately, the transatlantic GMO dispute has forced many developing countries to take sides and has crowded out systematic and pragmatic domestic debates in these countries about the types of biotech applications they may want and need. At the policy level, advocates of stricter GMO regulation appear to have been more successful in recent years in exporting their approach to developing countries (Cohen & Paarlberg, 2004). They have operated

primarily in the framework or at least in the name of the Cartagena Protocol on Biosafety, which was adopted in 2000 and has been ratified by more than 140 countries – among them all EU member countries, but not the USA. The Protocol seeks to protect biodiversity from risks posed by GMOs. It establishes an advanced informed agreement procedure, embraces the Precautionary Principle (PP), sets up a Biosafety Clearing-House, and offers assistance to poor countries in implementing the Protocol (Falkner 2000). Many GMO-adverse NGOs and some government agencies, primarily from Europe, have explicitly or implicitly used the Cartagena Protocol process to support GMO-adverse stakeholders in developing countries and establish regulatory policies subscribing to strict versions of the precautionary principle (Cohen & Paarlberg, 2004; Paarlberg 2001).

It remains unclear whether the current dominance of GMO-adverse support for developing countries will lead the majority of poorer countries to follow the EU model. In fact, many developing countries have recently become more skeptical about whether GMO policies modeled after those of the EU are in their best interest (de Greef 2004). Surveys carried out in developing countries (e.g., Aerni and Bernauer 2006; Pew Initiative 2006; see also Hoban 2004) suggest that stakeholders in these countries hold rather pragmatic views, particularly with respect to indigenous biotech applications that would avoid economic dependence on industrialized countries and their biotech industry. Positive attitudes towards GMOs are most pronounced in developing countries that are at the forefront of GMO research, e.g., China, India, and South Africa (e.g., Gupta and Chandak 2005). GM-crop acreage in some developing countries is also on the rise (ISAAA 2007). These trends in developing countries may in fact bring back some sanity into the political rhetoric of interest groups from rich countries about what developing countries want and need. They are likely to push GMO-hostile interest groups into revising their claims about catastrophic health and environmental risks that are out of tune with developing country demands and also the vast majority of scientific risk-assessments. They will also make it more difficult for GMO proponents to sustain claims that GM-crops will allow poor countries to leapfrog in agricultural development and achieve the “end of hunger” (see, e.g., Conway 2005; Kleckner 2006). In other words, to the extent the transatlantic dispute does not suppress bottom-up processes in developing countries we are likely to see, within the next few years, more pragmatism and recognition that some agri-biotech applications may, under particular conditions, indeed offer benefits to farmers and consumers in developing countries.

5. Normative Dilemma and Potential Solutions

The transatlantic GMO dispute is interesting also from another normative perspective. Normative, in this context, does not refer to debates on whether GMOs are ethical in whatever sense. It refers to the question of who should be entitled to decide on the approval of GMOs or particular biotech applications for research, commercial cultivation, and marketing. In essence, such decisions can be taken by the market (i.e., by producers and consumers), voters and/or their representatives (policy-makers), scientists, or any combination of the three.

The US approach to GMO policy relies heavily on the first (market) and third (science) element, the EU approach largely on the second (political decision) and third (science). In the EU, the political has clearly trumped the scientific element. This is most apparent in those cases where proposals by the EU Commission to force countries with unilateral bans on EU-approved GM-crops to lift these bans have been rejected by the Council of Ministers – the Council is composed of ministers from all EU member country governments. The reasoning of the majority in those cases has been, very explicitly, that they do not wish to overrule countries whose population and government do not want to import, cultivate, and/or consume

GMOs. The WTO's SPS Agreement (and also US policy), in contrast, operates with scientific risk-assessment criteria, with some room of manoeuvre left by the precautionary principle. Supporters of the scientific approach claim that "sound science" is the only effective and non-arbitrary barrier against trade restricting environment, health and safety regulations that serve protectionist, rent-seeking purposes. Critics of this approach argue that science can, in the case of GMOs, not offer conclusive evidence on risks and benefits, and that science-based decision making is tantamount to "technocracy" rather than democracy (see Jasanoff 2005).

Switzerland is the most extreme example of the political approach. In its system of direct democracy, the government must call a public vote on initiatives that are signed by at least 100'000 voters. In November 2005, an initiative imposing a five year moratorium on all commercial cultivation of GM-crops was approved with a 56% majority. Surveys carried out thereafter have established that around 10-15% of No-voters meant to reject GMOs and thus voted the wrong way (the reverse error was much less important). Hence the de facto Yes-vote was in the order of 70% (Hirter and Linder 2005). Whether the moratorium will be extended will become clear in late 2010. Given that the WTO panel in the EU-USA dispute found the EU's de facto moratorium from 1998 to 2003 as well as the unilateral EU member state bans to be in violation of WTO rules, the Swiss moratorium may well violate the SPS Agreement also: it is based on a purely political decision, and not a scientific risk assessment (though risk-assessments on GM crops in Switzerland have been carried out). However, most proponents of the "sound science" approach would concede that the Swiss decision was as democratic as such a decision can possibly be.

There is no obvious solution to this dilemma that would satisfy both "sound science" and democracy requirements. We can primarily highlight that the dilemma exists, and that the WTO system of adjudication tends to perform better – in terms of real economic outcomes, rather than legal verdicts – when dealing with claims of "conventional" protectionism (e.g., discriminatory tariffs, taxation or subsidies) than with claims concerning environment, health and safety regulation. The only other WTO dispute resembling the GMO conflict is the EU-US dispute over growth hormones in beef production (Caduff 2005; Kelemen 2001). In that case the WTO decided in 1998/9 that the EU was in violation of global trade law. But instead of changing its regulation on growth hormones the EU chose to subject itself to punitive tariffs by the USA and Canada (since 1999) in the order of 100 million USA p.a. It is very likely that the EU would behave similarly should the plaintiffs in the GMO case seek and obtain WTO approval for punitive measures. Even worse, the value (in monetary terms) of such measures is likely to be higher than in the beef hormones case (the costs imposed by the EU's GMO policies on foreign producers are higher) and may thus cause all sorts of nasty side-effects in EU-US trade relations.

As shown in this chapter, escalation of the GMO dispute in the WTO will not generate a solution that helps producers in plaintiff countries. "Out-of-court" solutions may in fact be more useful in this and other, similar cases. Such a solution in the GMO case will probably have to involve some sort of labeling of GM products (see Weirich 2007). While solutions outside the WTO are obviously not ideal they should be viewed in perspective. As noted above only a tiny fraction of all country pairs (country dyads per year) ever get involved in a WTO dispute. And the large majority of the more than 300 disputes taken to the WTO since 1995 were resolved quite effectively. If cases such as the GMO conflict were dealt with outside the WTO this would not call into question the very positive overall record of the WTO adjudication system. Rather, it would protect the WTO system from problems it can not effectively solve.

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