

## **The risks of agrobiotechnology: between science, politics and economy**

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### **Abstract.**

*This research analyzes the contentious relationship between the logics of politics, economics and science in setting policy on the health and environmental risks of agricultural biotechnology. First, I utilize the sociology of risk and of science to define the risk as a source of disputes between countries and the differentiated logics of social spheres. As there are conflicting policies for genetically modified foods and they are marketed internationally, the decision of one country affects others, setting up a commercial dispute. This has been analyzed empirically in the World Trade Organization Panel Report entitled European Communities - Measures affecting the approval and marketing of biotech products, in which the United States, Canada and Argentina contested the European policy related to biotechnological products. The research demonstrates that risk has been challenged the boundaries between politics, science and economy.*

### **The risks of agrobiotechnology: between science, politics and economy**

This article<sup>1</sup> is about risk and the contentious relation between politics, science and economy in treating it. This sociological analysis aims to go beyond the specification of the differentiation of these three spheres of social life and explore situations of struggle for autonomy (Bourdieu 1983, 1996, 2001, 2004) in the interactions among these logics in defining the risk policy of agrobiotechnology<sup>2</sup>. The question that guided the research was: what is the division of labor between science, politics and economy in the settlement of the controversies over the risks of agrobiotechnology? Since there has been an ongoing regulatory divide on the issue, specially between major exporters and importers of grains,

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<sup>1</sup> This paper is based on the Master thesis "O risco nas fronteiras entre política, economia e ciência: a controvérsia acerca da política sanitária para alimentos geneticamente modificados", conducted at the University of Brasilia. I would like to thank Fernanda A. F. Sobral for her careful supervision, and the postgraduate colleagues for the collective process of knowledge building; Sergio Costa, Laurindo Minhoto and Christina Marques.; the colleagues from Anvisa for our shared interests and the interesting debates, specially to Erika Veiga, Laila Mouwad and Rafael Mafra for the pleasure to discuss the GMOs issue, risk analysis and international trade; and Manuel Bastias, for his careful revision and helpful comments on the last version of this paper.

<sup>2</sup> This study relates to the agricultural products obtained with the application of modern biotechnology: seeds or grains for human and animal consumption. In this paper the terms transgenic food and feed, genetically modified organisms (GMOs) – common language use - will be used interchangeable as well as the terms biotechnological products or products obtained from modern biotechnology (the use made by the WTO Panel).

high expectations were directed towards the results of the Panel of the World Trade Organization (WTO) entitled *European Communities - Measures affecting the approval and marketing of biotech products*, which was issued in 2006. Therefore, this was chosen as the empirical material to investigate the struggles between the logics of politics, science and economy in deciding over health and environmental risks related to a technology.

First, it is important to highlight the role conferred to science in the WTO Agreements, specially regarding health. This theme entered the international trade agenda due to the perception that States could use health policy arguments as a justification to create barriers to the free circulation of products. The question became more pressing in a context of gradually decreasing quantitative restrictions to trade on goods, such as quotas and tariffs.

Therefore, the topic of health risks was integrated in WTO rules with the objective to prevent the economic field from being affected by possibly abusive uses of health policies. It was an attempt to maintain the autonomy and differentiation of the economical and political logics. Politics cannot intrude the functioning of the economic sphere: if there are measures aimed at market protection, these must be based on trade rules, that is, be part of a trade policy and not disguised as health policy. For its turn, the economic field cannot deny politics the right to function according to its logic in areas of its specific competence, for example that of health protection. In establishing an Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement), the economic field intends to make the borders of activity of each sphere clear, when dealing with problems that challenge them, such as health risks.

This has been achieved by assigning science the role of mediating between the two fields. The main obligation of the SPS Agreement is that health protection measures that may affect international trade are based on scientific principles, and that they should not be maintained without sufficient scientific evidence (art. 2.2 conf. OMC 1999: 60). By limiting the operation of the political field in such a way, the actors in the trade regime hope that politics does not excessively interfere in the economy.

After this brief introduction, this paper proceeds in two parts. The first outlines the theoretical path to the construction of a concept of risk with an emphasis on its disputable character, which enables struggles over the definition of its reality. The objective of this theoretical reconstruction is to provide an alternative to the concept commonly found in the risk research, one that is based on an objective ontology. The second analyzes the trade dispute in the WTO regarding the European policy for biotechnological products in which countries compete, recurring interchangeably to scientific, economic and political arguments.

## **1. The contestable ontology of risk**

One of the main problems signalled by Bonß (1995), in his book on the sociological history of risk, is the weakness of a sociological theory on the topic. Characterized as a discipline that deals with the question of “order”, the terms risk and uncertainty only appear in sociological theories as a deviation that should be transformed into order. According to the author, sociology’s input to risk research consists in providing a concept of risk informed by a theory of modern society. Such a perspective assumes that uncertainty and insecurity are normal and constitutive to the modern experience, instead of being considered deviations in need of correction. Thus, risk becomes the modern form of dealing with uncertainty and insecurity.

The premise for this new form of dealing with uncertainty is that the future is not seen as the reproduction of some cosmological order but as a result of human action. The type of action characterised by risk is liberating, experimenting and based on the idea of an open future. This leads, in my view, to the main contribution of the sociological debate on risk: the handling of the ambivalent and contestable semantic of this concept. Risk can be characterized as a present decision based on the expectation that advantages can be gained even if damage may occur. However, both refer to an uncertain future: the gains and the losses. To risk is to pursue actively this double possibility instead of deciding otherwise. Niklas Luhmann (2008) has emphasized this constitutive aspect of modernity as the semantics of risk.

Therefore, conceptualizations of risk in terms of either anticipated catastrophes or negative consequences, i.e. side-effects of the modernization process, present in Ulrich Beck’s (Beck 1986, 2007, Beck et. al 1997, 2003) reflexive modernization theory, fail to grasp the constitutive ambiguity of the modern semantics of risk<sup>3</sup>. Luhmann (2008) is more refined and consistent when he proposes the distinction risk/danger. To use risk and danger interchangeably, or to apply the concept of risk only as a negative term, is to deny the difference that defines risk in opposition to other terms like danger, hazards, threats or damage. The identification of risk with the formula ‘size of damage x damage probability’, common in most approaches to this research area, deviates the attention to the fact that risks are associated with decisions and not just natural catastrophes. *And this is precisely the characteristic that leads to the politicization of risks: the attribution to a decision that might have not been taken and that was taken with a view to obtain certain advantages despite possible losses.*

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<sup>3</sup> La Mendola (2005: 60) makes an alert: “the displacement of the meaning of the term ‘risk’ to its possible negative results obscures the main issues: as if Colombo would have wanted to go shipwreck or as if an entrepreneur, whose social identity foundation is based in the act of assuming the risk of the enterprise, would wish the failure of its economic performance”. Also noteworthy is the remark made by Zinn (2008): many risk social researchers argue that the belief that human action can shape the future by means of science and technique has been substituted by the perception of their negative effects. However, he adds, this presumed change has yet to be verified empirically.

In order to understand the conflict over agrobiotechnology, it is important to use a theoretically informed concept of risk that emphasizes its contestable ontology. The social relevance of the concept can only be precisely analysed if one moves beyond the rational risk calculation based on individualistic premises. The problem is not of a hazard identification and estimation of its probability, but lies in the attribution. It is not how one calculates risk, but who decides and who is affected by the decision<sup>4</sup>.

These two forms of conceptualizing risks will be applied to the analysis of our empirical case: the WTO dispute over GMOs. The concept of risk used in the context of the international food market relates to two types of damage (health and environmental) and to the scientific method of risk identification. As noted by Petriccione (2004), one can only oppose to the advancement of a new technology – and restrict trade - by invoking this particular conception of risk: “a function of the probability of an adverse health effect and the severity of that effect, consequential to a hazard(s) in food” (Codex Alimentarius Commission, 2003)<sup>5</sup>.

This should be considered the “native” category, i.e., the definition used by the actors in the WTO dispute settlement procedures. In order to analyse this material, I will use the sociological category of risk, as discussed above. This will enable us to see the contestable and ambiguous nature of risk that can be explored when two perspectives are simultaneously observed. This concept helps to explain long-standing disputes that are not easily resolved with recourse to science alone. Either one notes the emphasis on the uncertainty about future or the emphasis on the double certainty of present gains and no confirmed losses. Thus, the contesting definitions of GMOs in the WTO Panel – as a (no) risk problem – illustrate well the relational character of risk and its relevance for sociological research.

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4 Luhmann considers that the increasing significance of experiments of participation in risk decision-making are a indicative that the problem is not one of calculation but its social dimension.

<sup>5</sup> *Working Principles for Risk Analysis for Application in the Framework of the Codex Alimentarius* (adopted by the 26<sup>th</sup> Session of the Codex Alimentarius Commission, 2003; Codex Alimentarius Commission Procedural Manual; Thirteenth edition), Annex 1 Definitions. The Codex Alimentarius is a joint FAO/WHO Programme dedicated to food standard setting with two objectives: protecting the health of consumers and ensuring fair practices in the food trade. The organization is considered as an international standard setting body serving as a reference in the SPS Agreement (Annex I 3.a).

## 2. The commercial controversy over the risk of GMOs

*The European Communities, throughout this proceeding, has attempted to remove biotechnology from the context of modern agriculture in order to exaggerate risks and scientific uncertainty. Canada, on the other hand, has sought to put biotechnology squarely back into its proper context.* □

Canada, cited in World Trade Organization (2006: 193)

□

*The malicious use of terms has distorted the view in which these products are considered and the way in which they should be treated. Particularly, we would appreciate if the European Communities would restrain itself from using concepts like, "cancer", "may induce dramatic unintended changes", "infestation ... to cause contamination", among others.*

Argentina, quoted in the World Trade Organization (2006: 199)

Taken from the Panel Report of the World Trade Organization (WTO) entitled *European Communities<sup>6</sup> - Measures affecting the approval and marketing of biotech products*, the above quotes show the international conflict over the definition of risks from GM foods. Canada and Argentina challenge the Europeans' emphasis on the existence of risks associated with these products, in a struggle for definitions. Together with the United States of America (USA), these countries form the other side of the trade dispute, the prosecution. In their view, such products are not an issue of risk.

This dispute between countries is also a struggle between the fields for defining the health risk of genetically modified food. Contesting the European *policy* for GMOs, Canada situates the framework of the problem at the frontiers of the *economy*, in referring to modern agriculture, while Argentina highlights the *scientific* discussion of risk.<sup>7</sup> Although they have made separate requests to initiate a Panel – resulting in the disputes WT/DS291/R, WT/DS292/R, WT/DS293/R - and submitted their pieces individually, one single Panel was established in 2003 to analyse their claims and its reports were issued in a single document in 2006 (WTO, 2006).

After analyzing the submissions of the parties, the Panel concluded that three types of measures were involved in the dispute:

- 1) the general *de facto* EC moratorium on the approvals of biotech products;
- 2) measures affecting the approval of specific products;
- 3) the EC member States safeguard measures against the commercialization of

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<sup>6</sup> The European Union (EU) is officially registered in the WTO as European Communities (EC). We will use give preference to the term used in the empirical material, namely, EC. Also the term "European" is used to refer to the EU statements where's the other three countries will be sometimes referred to as "the Complaining" or "the Prosecuting" countries.

<sup>7</sup> It is important to state, however, that the WTO Panel did not rule on the safety or risks related to these products. Its judicial review concerns the respect to the rights and obligations of the Parties in dispute.

products that had been approved on the European level (WTO, 2006: para. 7.98).

Due to the length of the WTO Panel Report and the impossibility to scrutinize its findings in this opportunity, one of the European measures under indictment was chosen – the moratorium on GM products. Not only was the moratorium the main complaint of this case, but it also illustrates the risky political situation of having to decide and how a decision about risk becomes a danger to affected parties.

The countries in the dispute have accused the European Communities of suspending the approval of biotechnology products. "It is at the critical decision-making junctures, or key stages, of the approval procedure that applications were blocked" (WTO, 2006: para. 7.442). In its defense, the EC argued that there was no moratorium, but the lack of approvals and delays were the result of prudent and responsible actions and not a "decision not to decide."

Noting that no final decisions have been taken during the period under review, the Panel deferred to the evidence of the moratorium. These pieces show, according to the claimants and the Panel, that the non-approval was politically motivated, not scientifically substantiated. The logic of operation specific to the political field is not independent, but rather is tied to science to legitimize itself against the economic field. This discussion proceeds in two stages, in which the findings of the Panel regarding the European moratorium are divided: the existence of a moratorium and the proofs of its general character.

## **2.1. The moratorium on genetically modified products**

In order to establish the existence of a moratorium, the Panel refers to a document of November 2000 and considers that it

"does not support the EC argument that there was a standstill because of "requests [by member States or the Commission] for additional information on complex issues of risk assessment and management". Rather, it suggests that the standstill was the result of public concerns and political debate, which, according to the document, made it difficult to approve applications"(WTO, 2006: para 7.524).

Further evidence was used to show that there were political motivations leading to the moratorium, such as the was affirmation of the European Commissioner for Health and Consumer Protection during the European legislation on GMOs of 1990,

"at a time when concern about GMOs was less obvious. The authorization procedure became obsolete as consumer concerns grew and consequently, Member States have become more and more reluctant to approve the placing on the market of new GMOs " (cited in WTO, 2006: para 7.526a).

He said this is an action of the Member States in response to public concerns, albeit

science:

"[d]espite our scientific advisors having given the green light for growing and marketing GMO plants and foods, our Member States have blocked new authorizations since 1998" (cited in WTO, 2006: para 7.526g).

Without scientific justification, the concern of the then European Commissioner for Trade and ironically now Director General of the WTO, was to stop any suspicion of protectionist motivation for the alleged default:

"the current moratorium is not plucked out of thin air by the Member States for protectionist reasons: it reflects the fact that food safety is a highly sensitive and political issue for European citizens" (cited in WTO, 2006: para 7.527a)

Since there was neither scientific basis nor commercial intent behind it, the moratorium would have been decided politically. It is not enough, however, that there are no protectionist motives in European moratorium<sup>8</sup>, because delays and suspensions are not free of implications for the economic field, as the Panel ruled:

"The absence of approvals is also a trade issue" (*idem*).

Thus, after analyzing various statements and European documents, the Panel concludes that they highlight the existence of a de facto moratorium that prevented the approval of biotechnology products:

"that action was taken by relevant authorities, or deliberately not taken, so as to prevent approvals for a certain period of time" (WTO, 2006: para 7.534).

The idea of deliberation is essential to conceptualize the moratorium as a typical political action, the result of a decision and, therefore, contingent. The way in which politics deals with the subject of risk is, in itself, always risky. Approving the product opens a path of opportunity, but the opportunities may not materialize or they can be accompanied by serious and irreversible damage to health and the environment<sup>9</sup>. Not to approve it impedes the existence of possible – but uncertain - opportunities, for fear of potential damage that, in turn, may not materialize. The decision to act banning biotechnology products or releasing them may be revealed in the future as inappropriate if the benefits or the damage are not confirmed.

The moratorium, however, is a third way of dealing with risk: it is neither the banning nor the imposition of restrictions, nor even unrestricted release: it is the postponement of the decision. And, being deliberate, it is itself a political decision – a decision not to decide. The

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<sup>8</sup> One could say that the trade regime went further beyond its main objective, i.e., to promote free trade between Member States. Wishing to limit sanitary barriers to international trade, it advanced economic liberalism in a more general way. Even if a measure is not protectionist in that it affects domestic and international producers alike, it can violate the WTO rules when not scientifically justified. The autonomy of the political field is challenged.

<sup>9</sup> Even when products are approved with some conditions like mandatory labeling and monitoring, there are cases like when GM seeds and animals are released in the environment, where in case of confirmed damage, a duly recall is not feasible.

object of the decision, that is, the issue of the risks of GMOs, is left to the background compared to a meta-political issue: a moratorium is a decision of how (not) to decide on the issue of risk.

The non-decision leaves the economic field standing and facing an uncertain and therefore risky future. The economic decisions of investment in research and product development depend on the prospects for marketing. The uncertainty about the conduct of politics is a danger to the economic actors that depend on the normal operation of the field, that is, approving or rejecting products, but always deciding.

## **2.2. The proofs of a general moratorium: scientific, commercial and political arguments**

The Panel's next step was to examine the procedures for approval of products to confirm that the moratorium was general. This exam is lengthy and we want to summarize it without following the categories of the Panel and by setting instead three elements: the scientific arguments, the commercial arguments and political arguments.

First, both the prosecution and the defense used scientific arguments. The EC justified the delays repeatedly in the following terms: "Member States raised legitimate scientific concerns" (WTO, 2006: paras 7.563, 7.574) and that "any delay which has occurred is entirely legitimate and related to risk assessment and management considerations" (WTO, 2006: para. 7.581). Science is its weapon of defense as well as the recourse to the term 'risk assessment' as a legitimate tool of a sanitary policy according to trade rules. The prosecution kept invalidating the scientific justification of the EC. Science is a weapon of counter-argument: "None of the member States objecting at the Regulatory Committee offered any competing risk assessment or scientific evidence for their objections" (WTO, 2006: para 7.582).

The Panel concluded for some product approval histories that there was no record of requests for further information to the applicant (WTO, 2006: para. 7.584), while in others it ruled that the EC Member objections were not based on a "scientific evaluation or risk assessment" (WTO, 2006: para. 7585). In order to issue its interpretation, the Panel entered into the scientific debate, consulting experts to assist it for that purpose (see, for example, WTO, 2006: paras. 7.586-88). It considered issues such as the use of marker genes for antibiotic resistance and a risk assessment for non-target organisms, as well as concerns about resistance and tolerance<sup>10</sup>.

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<sup>10</sup> "In response to a question from the Panel, one of the experts advising the Panel, Dr. Squire, observed that the issue of antibiotic resistance was considered in the SCP's opinion and found not to pose a risk. Furthermore, he notes that although there is now a widespread perception that antibiotic resistance should not be introduced



A trade forum as the WTO has become, in these moments, a court of science, where border issues of science were discussed. It should be noted that the involvement of science in the panels of the WTO carries risks for the science itself, as it may transfer scientific controversies to the context of a commercial dispute. When hiring advice from individual experts, Panel members with expertise in commercial law are placed in a position to arbitrate between different positions of scientists, a task for which they are not equipped. The risk that science loses its autonomy is a danger to the economic field, as it called upon science due to its differentiation and autonomy.

After the scientific motivation for the delays, it is worth examining the use of commercial arguments by the parties. The European Communities argued that there was removal of a significant number of petitions for commercial reasons and changing strategies. One of the reasons was that "the request was withdrawn by the applicant with the indication that the applicant preferred to no longer be associated with genetically modified products because of the negative response from the market" (WTO, 2006: para. 7.1103).

The defense emphasized that the side of the commercial opportunities brought by GM products has not been confirmed. The Panel noted the counter-argument of the prosecuting countries that the business reasons for the withdrawal of the petitions were due not to the market response, but the to high legal risks generated by the moratorium and, concomitantly, due to cost and time factors. According to the Panel, however, purely commercial reasons do not detract from the political authority the right to delay their evaluation, provided there is justification to do so.

Finally, the Panel examines the political argument. The plaintiffs countries brought as evidence of the moratorium a formal declaration made by five Member States of the EC (known as the Declaration of the Group of Five), at a meeting of the Council of Ministers in June 1999 (WTO, 2006: para. 7474), as proof that these States would act as a minority to block the approval process. The Panel found that the statement shows the intention of the countries that sign it to prevent the approval of GMO products in the European market.

The prosecution argued further that the European Commission could have approved the product in spite of the blockade of the Group of Five, but resigned the use of its powers because it "considered that it lacked the necessary political support for completing approval procedures by adopting its own draft measures " (WTO, 2006: para. 7.489). In the voting held in the European Regulatory Committee during the period under review, the Panel found that no majority was obtained. Although it considers it reasonable, in the political point of view, that in these exceptional circumstances the Commission did not establish new voting procedures given the difficulties of obtaining support from the Member States, the Panel

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through herbicide resistant products, cotton occupies a very small area in Europe and does not present potential problems of the type that might be associated with other crops" (WTO, 2006: 7.587).

states that this does not relieve the Commission from using its powers to complete the approval processes. Therefore, these justifications cannot cross the political field to maintain their validity in the economic field.

**Box I - The arguments in dispute**

|                             | <b>European Communities</b>   | <b>Complaining Countries</b>  | <b>Conclusions of the WTO Panel</b>   |
|-----------------------------|---|---|---|
| <b>Scientific arguments</b> | There were delays in decision-making due to considerations of risk assessment and risk management.  | The European countries had not presented an alternative risk assessment to support objections to specific product approvals.              | It consulted experts and concluded that the EC did not have scientific evidence not to take a decision.   |
| <b>Economic arguments</b>   | Petitions were withdrawn because the manufacturers did not want to be associated with biotechnology products due to the negative response from the market and changed their strategy. | The withdrawal of the petitions were due to higher legal risks generated by the moratorium and, concomitantly, the cost and time factors. | Purely commercial reasons do not deprive the political authority of the right to delay their evaluation, provided there is justification.   |
| <b>Political arguments</b>  | GMOs are a <i>new issue of risk</i> and the political sphere is autonomous to decide how to deal with it without interference from trade rules.                                       | There was a political decision not to take decisions, which discriminates against exporters of biotech producers.                         | The suspension was the result of decisions of public concern and political debate and was a measure adopted by the actions and omissions of the Member States and the European Commission. This political decision has trade effects. |

In short, the Panel concluded that a moratorium on approvals of GMOs was in force in the European Communities during this period and that it was widespread and a de facto measure, as it was adopted not through a formal rule, but by the actions and omissions of the Member States and Commission (WTO, 2006: paras. 7.1271-72). A more detailed analysis of the WTO consistency of the EC measures has been made in another opportunity (Motta, 2008: 80-86). For the present context, suffice it to say that the Panel did not rule on its scientific basis of the moratorium, since it was not considered to be a SPS measures, but the application of one, namely, of the approval procedures. Therefore, the Panel addressed the procedural obligations of the SPS Agreement contained in art. 8 and Annex C (1)(a): Members have to assure that control, inspection and approval procedures are undertaken

and completed without undue delay. The Panel, thus, concluded that the moratorium violated WTO obligations.

### 3. Conclusion

The study of a trade dispute in the WTO made it possible to explore the ambivalence of the concept of risk and its potential for conflict. The European Communities argued that the risks posed by the new technology could also be new, because they are largely unknown<sup>11</sup>. The emphasis on the uncertainty about future damage has paralysed the decision-making process in the EC. Meanwhile, the three Complaining countries in this dispute had taken the risky decision: they considered the new technology to bring advantages that were worth putting something in play. The subject is not treated as a special problem of risk but one of a dual certainty: that there are no new or unknown hazards and that opportunities are confirmed<sup>12</sup>. For them, experience has proven the benefits of transgenic crops while science has proven the absence of adverse effects to health and to the environment. Although both sides rely on science to decide on this complex issue, they arrive at incompatible conclusions.

The question that imposes itself is: since the EU has lost the trade dispute in the WTO, has the controversy over the risks been settled? After almost four years of completion of the trade dispute, the EC has failed to implement all the recommendations of the Panel<sup>13</sup>. Moreover, new bans were made by Member States of EU approved GM products<sup>14</sup>. This indicates that politics stand in defense of its autonomy to act according to its operating logic in the definition of risk, exercising its power of refraction of the pressures of the commercial field. One can assume, therefore, that the economic field could not, for now, end this conflict on risk.

So, how will the GMOs issue become, if not consensual, than at least less controversial? If risk depends on an attribution to a decision, the solution does not lie in more science. It is not a question of calculation or measurement, but of who decides and who is affected by it. The definition of GMOs as a risk problem will be less controversial the wider its

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<sup>11</sup> "A genetically modified organism (GMO) is an organism in which the genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination. Contrary to conventional methods of altering genetic material, genetic modification allows for the crossing of natural species barriers, or for the transfer of single or few genes instead of whole genomes". (European Communities quoted from WTO, 2006: para. 4.335).

<sup>12</sup> "Modern biotechnology has a number of proven benefits for human health and the environment, including higher agricultural output, more nutritional food products, and lower utilization of agricultural chemicals, fertilizers, and water in commercial farming" (USA quoted from WTO, 2006:28).

<sup>13</sup> For updated information see the website of the WTO, available on [http://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds291\\_e.htm](http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds291_e.htm), accessed on 30.03.10.

<sup>14</sup> According to official information from the EC accessed on 30.03.10 and available at [http://ec.europa.eu/food/food/biotechnology/qanda/d1\\_en.htm#d](http://ec.europa.eu/food/food/biotechnology/qanda/d1_en.htm#d).

decision space becomes. Not to science alone will be entrusted the last word, indeed neither to the international trade regime.

The framework of risk analysis is designed to put the three fields (economy, science and politics) in an interactive process as it confers politics the role of “risk manager” that should base its decisions on a scientific risk assessment and take into account economic and consumer interests. Nonetheless risk management is still perceived as a technocratic exercise (Vos and Everson 2009: 6), in which State agencies have competence to decide on ‘objective’ questions rather than normative and political ones. In this model, the space for democratic deliberation is limited, since it is deemed inefficient to solve technical problems.

The application of biotechnology to agriculture was a decision made by market actors, which thus have created a demand to State regulation. It appears as a technical problem to be decided upon – food safety of the insertion of that gene, environmental impact on non-target organisms, rules of co-existence, labeling, etc. -, instead of a choice between alternatives to be made. However, this model has been contested in the case of GMOs leading to a politicization of issue. Due to the contestable ontology of risk, rather than limiting politics to a scientific anchor, a possible compromise to be reached in the case of GMOs tend to go into the direction of more politics.

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## **LIST OF ABBREVIATIONS**

EC - European Communities

GM – genetically modified

GMOs - genetically modified organisms

USA - United States of America

WTO - World Trade Organization