

RISK ASSESSMENT UNDER WTO LAW:
WORKABLE REQUIREMENT OR *PROBATIO DIABOLICA*?

Alberto ALEMANNO

HEC Paris, France

alemanno@hec.fr

ABSTRACT

In an effort to eliminate protectionism and unnecessary non-tariff barriers, the WTO/SPS agreement embraced science as a privileged tool for distinguishing between legitimate and illegitimate Member States' measures inspired by public health reasons. However, in adjudicating disputes involving the scientific basis of trade-restrictive measures, the judicial bodies of the WTO have struggled to turn the SPS scientific discipline into a workable (risk assessment) requirement. As a result, defending Members have lost all major SPS cases to date - the *Hormones*, *Salmon*, *Agricultural products II*, *Apples* and *Biotech* cases - because of their failure to comply with the required scientific justification discipline. At a time when the risk assessment requirement seems to have been converted into a *probatio diabolica*, this paper examines, in the light of the almost 15 years of judicial application of the SPS Agreement, whether its scientific discipline is still a workable requirement, effectively enabling the interpreter to filter protectionism out of SPS measures. Although time and the judicial practice developed under the SPS have partly tarnished science's promise of value-neutrality, this paper ventures to suggest, in the absence of any less arbitrary criterion, some recommendations for turning risk assessment into a workable requirement.

Keywords: International Economic Law, WTO, Science, Risk Assessment, SPS Agreement, WTO Dispute Settlement System

Introduction

Governments around the world are confronted on a daily basis with decisions concerning risks to human, animal or plant health or life posed by tradable products and their manufacturing processes. In response they tend to adopt, deliberately or not, measures that hinder the trade of products. While the adoption of these measures may indeed be necessary for the protection of legitimate interests, their implementation may also be motivated by a desire to shield domestic industries from imports coming from foreign countries. It is indeed tempting for some States to compensate for the reduction in traditional barriers to trade, which has been induced by the GATT/WTO framework, by introducing non-tariff barriers grounded on health concerns¹.

Hence, how to reconcile the inherent tensions between the declared public health goal pursued by these measures and the free trade imperative immanent in our economic system? In other words, how to distinguish between a public health measure disguising protectionism and a genuine health measure?

A normative answer to these hard questions can be found in the Sanitary and Phytosanitary Agreement (SPS), which was set up at the end of the Uruguay Round negotiations leading to the establishment of the World Trade Organisation (WTO)².

The purpose of this Agreement is indeed to maintain the sovereign right of any Member to provide the level of health protection it deems appropriate (so called, ‘appropriate level of protection’ or ‘ALOP’)³, while at the same time ensuring that that these sovereign rights are not misused for protectionist purposes. To achieve these “shared, but sometimes competing, interests of promoting international trade and of protecting the life and health of human beings”⁴, the WTO’s drafters, rather than relying solely on non-discrimination, chose scientific justification as the privileged tool for identifying protectionism. Indeed, the SPS Agreement requires Member States to base their SPS measures on risk assessments, if they are choosing not to use international standards⁵. It is only when SPS measures are based on international standards that, benefiting from a presumption of conformity with WTO law, they are not subject to the risk assessment requirement.

The increased reliance on science as a benchmark against which to check the legality of regulatory action stems from the belief that, “by bringing constraints on valid lines of

¹ For a detailed history of the evolution of GATT rules on domestic regulations, see A.O. Sykes, *Products Standards for Internationally Integrated Goods Markets*, Washington, DC: Brookings, 1995, pp. 63-68.

² Since the 1979 Tokyo Round some countries feared that the lowering of border measures would be circumvented by disguised protectionist measures in the form of technical regulations, notably sanitary and phytosanitary regulations. For this reason, already on that occasion, a Plurilateral Agreement was adopted on Technical Barriers to Trade, also called “Standards Code”. See M. Trebilcock and R. Howse, *The Regulation of International Trade*, London-New York, Routledge, 1999, p. 145. See also G. Marceau and J. Trachtman, *The Technical Barriers to Trade Agreement, the Sanitary and Phytosanitary Measures Agreement, and the General Agreement on Tariff and Trade, A Map of the World Trade Organization Law of Domestic Regulation of Goods*, supra note 684, pp. 811-881. The operation of the Standard Code is generally perceived as a failure, see D.G. Victor, *The Sanitary and Phytosanitary Agreement of the World Trade Organisation: An Assessment After Five Years*, 32 NYUJ Int’ L. & P. 874 (2000).

³ Annex A, paragraph 5, to the SPS Agreement defines “Appropriate level of sanitary or phytosanitary protection” as “[t]he level of protection deemed appropriate by the [WTO] Member establishing a sanitary or phytosanitary measure to protect human, animal or plant life or health within its territory.” The Note attached to this definition states that many WTO Members refer to this concept as the “acceptable level of risk”. See also the Preamble of the SPS Agreement which stipulates that “no Member should be prevented from adopting or reinforcing measures necessary to protect human, animal or plant life or health”.

⁴ EC-Hormones Appellate Body Report, WT/DS26/AB/R, WT/DS48/AB/R adopted on 13 February 1998 (hereinafter “EC-Hormones, AB Report”), para. 177.

⁵ Articles 3.3 and 5.1 SPS.

argument being based on data and methods used to estimate risk”⁶, science ensures that a given SPS measure, despite its divergence from an international standard, addresses a real, objectively established health risk. Under this view, scientific justification, operating in a denationalised dimension, would be more effective than non-discrimination in spotting protectionist measures and in dismantling sham health measures discovered to be *de facto* trade barriers. Indeed, courts tend to feel relieved of the responsibility of deciding what is safe if they are persuaded that the answer comes from a scientific experts’ crystal ball⁷.

Although the SPS/WTO framework is entirely built upon the equation between science-based and the absence of trade protectionism, we know by now that this equation, being overly simplistic, contains several limits. As highlighted by the socio-cultural critique of scientific knowledge, the current practices of scientific risk assessment do not seem to reflect, and thereby corroborate, this vision⁸. In fact, despite science's promise of value-neutrality, science does not provide uncontested risk assessments by reference to which the differences over alternative risk management options can be mechanically tested. Science, operating in a stochastic world, has to deal with both uncertainty and variability (inter- and intra-species). Notwithstanding the abovementioned inherent limits of the scientific requirement to capture the reality of the risk regulations of nations worldwide, the experience of the WTO Dispute Settlement Body (DSB) shows that science plays an increasingly dominant role in adjudicating SPS disputes. In particular, the risk assessment discipline sketched out by Article 5 has been pivotal in the functioning of the Agreement during its first years of operation. In all major SPS cases to date, the contested national measures, being insufficiently specific or failing to be rationally or objectively related to the relevant scientific evidence to satisfy Article 5.1, have been found to be inconsistent with the risk assessment requirement⁹. Indeed, as it will be illustrated below, the major flaw of the current SPS scientific regime does not lie in the Agreement itself, or its epistemic foundation, but rather in the manner in which it has been judicially interpreted by the WTO Dispute Settlement Body (DSB). In particular, the scientifically demanding interpretation of the risk assessment requirement, which is expected to be specific and to show more than the possibility of harm, has become a sort of *probatio diabolica*, resulting in the systematic strike down of all SPS measures which, according to the WTO judicial panels, are scientifically unsupported, regardless of their discriminatory character. This scientifically demanding and excessively rigid interpretation of the risk assessment requirement, in turn, by usurping the law of its adjudicating power, produces several other consequences. First, by rejecting the inherent limits and complexities of the

⁶ D. Crawford-Brown, J. Pauwelyn & K. Smith, *Environmental Risks, Precaution and Scientific Rationality in the context of WTO/NAFTA Trade Rules*, 24(2) *Risk Analysis* 461, 465 (2004).

⁷ For an insightful book on the law and science interface, see R. Feldman, *The Role of Science in Law*, Oxford, 2009.

⁸ See, e.g., H. Longino, *Science as Social Knowledge*, Princeton, NJ: Princeton University Press and U. Beck, *Risk Society: Towards a New Modernity*, London: Sage, p. 29, 174 (who dismissed the claim of science to value-neutrality as a “chimera”).

⁹ EC - Hormones, AB Report, paras 199-201 (where the Panel rejected general studies of the carcinogenic risk of hormones and suggested that a proper risk assessment of these substances should have been undertaken on an individual basis); Australia - Salmon Measures Affecting the Importation of Salmon WT/DS18/R modified Panel Report, para 8.99; Australia - Salmon, AB report, paras 128-135. However, it is worth mentioning that, following the adoption of a revised set of quarantine measures, this dispute has been successfully closed by an Article 21.5 implementation panel. It therefore represents the first case where a Member's controversial SPS measure has been upheld as meeting the rigorous scientific discipline of the SPS Agreement; Agricultural products, AB Report, para 113; Japan - Apples, Panel Report, paras 8.127, 8.277-280 (where the Panel rejected Japan's risk assessment because it did not focus sufficiently on the risk of transmission of fire blight through apple fruit as opposed to other modes of transmission); in EC-Biotech, neither the general *de facto* moratorium nor the product specific measures have been examined under Article 5.1, having being found not SPS measures by the panel. However, the EC Member States' safeguard measures, being considered SPS measures, have been found in breach of Article 5.1

scientific method and the reality of scientific uncertainty, this interpretative approach prevents Members States from acting against novel risk situations characterised by low certainty and high salience. Second, this outcome inevitably encroaches upon the regulatory self-determination of WTO Members as it is expressly recognised within the same SPS Agreement. Third, the tension between the scientific discipline of the Agreement and Member States' regulatory autonomy is further exacerbated by the resulting intrusive role played by the WTO judicial bodies who, after having judicially construed a scientifically demanding risk assessment requirement, find themselves trapped in the (epistemically) difficult exercise of verifying whether a given SPS measure satisfies that requirement. Fourth, this interpretative approach, by capturing an increasing number of SPS measures that, although scientifically unsubstantiated, do not pursue a protectionist goal, has proved to be over-inclusive. Fifth, as exemplified by the trans-Atlantic tensions caused by the *Hormones* and *Biotech* disputes¹⁰, the existing scientific discipline, as it has been judicially interpreted in the past, produces the perverse effect of providing incentives for WTO members to hide the consumers preferences of their societies behind scientific arguments in order to create (or at least artificially inflate) scientific disagreement on a given phenomenon.

It is against this backdrop that this paper examines, in light of the first 15 years of the application of the WTO/SPS framework, whether this provision is still a workable requirement which enables the interpreter to distinguish between right and wrong SPS measures under WTO trade rules. In the wake of the findings of the *AB Hormones II* report, this paper, first, illustrates the genesis of the scientific discipline provided for by the WTO/SPS Agreement, second it looks at how this discipline has been interpreted by the WTO DSB and, third, identifies the consequences stemming from such an interpretation. Finally, in the absence of any less arbitrary criterion, this paper ventures to suggest how to turn the scientific discipline from a *probatio diabolica* into a workable requirement, by formulating a list of recommendations.

2. The Genesis of the scientific discipline in the GATT/WTO

Before analysing the science-based provisions of the SPS Agreement, this section illustrates the genesis and evolution of the scientific discipline within the GATT/WTO system in order to contextualise it diachronically.

2.1 The de facto scientific requirement under the GATT Agreement

The 1994 GATT agreement – like the original GATT agreement of 1947 – does not contain any direct reference to science and leave countries free to establish whatever public health regulations they wish. The only constraints on the exercise of their legislative autonomy are principally set by Article III:4¹¹, which requires that these regulations be applied in a non-

¹⁰ T. Cottier, Risk Management Experience in WTO Dispute Settlement, in D. Robertson & Aynsley Kellow (Ed.), *Globalisation and the Environment – Risk Assessment and the WTO* 42 (2001). According to Cottier, the trans-Atlantic tensions caused by the *Hormones* and *Biotech* disputes result less from scientific disagreement than from European consumers' preferences, such as social and ethical concerns

¹¹ According to this provisions: "The products of the territory of any contracting party imported into the territory of any other contracting party shall be accorded treatment no less favourable than that accorded to like products of national origin in respect of all laws, regulations and requirements affecting their internal sale, offering for sale, purchase, transportation, distribution or use. The provisions of this paragraph shall not prevent the application of differential internal transportation charges which are based exclusively on the economic operation of the means of transport and not on the nationality of the product".

discriminatory way on imported and domestic “like products”, and Article XI¹², prohibiting all restrictions “instituted or maintained on the importation or exportation of any product”. However, Article XX GATT¹³ allows any Contracting Party to depart from GATT obligations by adopting restrictions on imports and exports justified *inter alia* for the protection of health and life of humans, animals and plants (let. b) or related to conservation of natural exhaustible resources (let. g)¹⁴.

According to the original case law¹⁵, then further developed after the incorporation of the provisions of GATT 1947 into the GATT 1994, a party invoking this exception must prove that:

- the policy for which Article XX(b) is invoked falls within the range of policies aimed at protecting public health;
- the measures for which the exception is invoked are “necessary” to fulfil the policy objective¹⁶, and that
- are not applied in a discriminatory manner and did not constitute a disguised restriction on international trade.

Therefore, under the GATT, Member States may adopt health- or environment-related measures without being asked to justify them scientifically, but simply by complying with the abovementioned requirements. Nonetheless, in practice, it would be difficult for the defendant to satisfy its burden of proof that its measure is “necessary” for the protection of health without resorting to scientific evidence. In fact, Members States have often submitted scientific evidence to the WTO in the past in order to demonstrate that their measures were covered under the exceptions provided by Article XX (i.e. not discriminatory, but truly health or environment related). Thus, for instance, in the first ever ‘scientific dispute’ to be litigated under the GATT, *Thailand – Cigarettes*, Thailand tried to justify its ban on the importation and sale of foreign cigarettes by arguing *inter alia* that chemicals and other additives contained in imported cigarettes might have made them more harmful to human health than the like products manufactured in Thailand. In so doing, the defending party made reference to a few scientific documents, such as the United States Surgeon-General's 1984 report as well as the report of the Council on Scientific Affairs of the American Medical Association. In *US -*

¹² This provision establishes that: “No prohibitions or restrictions other than duties, taxes or other charges, whether made effective through quotas, import or export licences or other measures, shall be instituted or maintained by any contracting party on the importation of any product of the territory of any other contracting party or on the exportation or sale for export of any product destined for the territory of any other contracting party”.

¹³ Article XX states: “[s]ubject to the requirement that such measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade, nothing in this Agreement shall be construed to prevent the adoption or enforcement by any contracting party of measures: [...] (b) necessary to protect human, animal or plant life or health; (g) or related to conservation of natural exhaustible resources”.

¹⁴ Apart from having been invoked in relation to Articles III and XI, WTO's adjudicating practice shows that Article XX has also been invoked to justify alleged violations of Article I (MFN principle), Article II (tariff concessions), Article IV (anti-dumping and countervailing duties), Article X (publication and administration of trade regulations), Article XIII (non-discriminatory administration of quantitative restrictions) and Article XVII (State trading enterprises).

¹⁵ See Panel Report, *US-Gasoline*, para 6.20; EC- Measures Affecting Asbestos and Asbestos-Containing Products WT/DS135/R adopted on the 12 March 2001 paras 8.170 and 8.177 (hereinafter: *EC - Asbestos*), para 8.169.

¹⁶ To satisfy the necessity test it must be proven that there are no alternative measures consistent with the GATT, which the Member State could reasonably be expected to adopt in order to achieve its health policy objective (*Thai-Cigarettes*, Panel Report WT/DS10/R, para 75), and in particular its desired level of protection (*AB Report, Brazil – Retreaded Tyres*, para 178).

Gasoline, involving a US measure applying stricter rules on the chemical characteristics of imported gasoline than it did for domestically refined gasoline, it was established that "inasmuch as they include the notion of 'protection', the words 'policies designed to protect human life or health' imply the existence of a *health risk*' and that, accordingly, the plaintiff must determine whether the prohibited product poses a risk to human life or health"¹⁷. In the subsequent *Shrimp-turtle* case¹⁸, after the US prohibited the import of shrimps harvested with technology that may adversely affect certain sea turtles¹⁹, the defending party tried to justify its ban by referring to a multitude of national (mainly in reference to the National Research Council) and international-led studies proving that all species of turtles face the danger of extinction.

The case law developed under the WTO law on Art. XX GATT became, as a result of some inevitable cross-fertilization between the GATT and the newly-adopted SPS Agreement²⁰, more sophisticated in regards to the GATT's scientific discipline. Thus, in *EC – Asbestos*, the panel clearly established that the health risk invoked under Article XX (b) must, "on the basis of the relevant rules of evidence", be proven to exist²¹. Notably, in determining how "the existence of a health risk" should be assessed²², the panel noted that, while "it is not its function to settle a scientific debate, not being composed of experts in the field", "it should base its conclusions with respect to the existence of a public health risk on the scientific evidence put forward by the parties and the comments of the experts consulted"²³. By referring to the position of the International Agency of Research on Cancer, which classified asbestos among the proven carcinogens, as well as the opinions of its appointed experts, the panel found that there was sufficient scientific evidence for the existence of carcinogenic risk associated with the inhalation of chrysotile fibres. More recent examples can be found in *EC-Tariff Preferences*, where the EC's additional tariff preferences under the Drug Arrangements of its Generalised System of preferences were not considered – as argued by the EC – to have been designed for the purpose of protecting human life or health, and in *Brazil – Retreaded Tyres*. Here, Brazil's policy of reducing exposure to the risks to human, animal or plant life or health arising from the accumulation of waste tyres was considered to fall within the range of policies covered by Article XX (b). In the latter case, even though the Panel decided not to appoint experts to conclude that there was a correlation between the spread of different diseases and the accumulation of waste tyres, it repeatedly relied upon scientific studies in the reasoning that led to this conclusion.

Thus, without requiring the defendant countries to show any assessment of the alleged risk, the case law decided under Article XX has developed an 'embryonic' *de facto* scientific

¹⁷ United States - Standards for Reformulated and Conventional Gasoline Appellate Body report WT/DS2/AB/R and United States - Standards for Reformulated and Conventional Gasoline WT/DS2/R Panel report as modified by the Appellate Body report.

¹⁸ United States - Import Prohibition of Certain Shrimp and Shrimp Products WT/DS58/R, paras 73-119, available at http://www.wto.org/english/tratop_e/dispu_e/distab_e.htm#r58

¹⁹ This is unless the harvesting nation was certified to have a regulatory programme and an incidental take-rate comparable to that of the US, or that the particular fishing environment of the harvesting nation did not pose a threat to sea turtles.

²⁰ The DSB seems to be aware of the problem. Thus, in *EC- Asbestos*, although the Panel noted that the SPS Agreement contains more detailed provisions than Article XX with respect to the scientific justification of a sanitary or phytosanitary, it also noted that in the first dispute settlement proceedings initiated under the WTO Agreement concerning Article XX of the GATT 1994 (*EC - Hormones*, para. 115), the Appellate Body had not sought to extend the principles of the SPS Agreement to the examination of the measures for which Article XX(b) had been invoked or even to base itself on them, although the SPS Agreement was already in force.

²¹ *EC- Asbestos*, Panel Report, paras 8.170 and 8.175.

²² *Ibidem*, para 8.180.

²³ *Ibidem*, para 8.182.

requirement. Yet, no trace of scientific discipline can be found within the GATT 1947 or the GATT 1994.

2.2 The codified scientific discipline under the WTO Agreements

It was only in 1995, when the WTO came into being, that scientific justification was expressly introduced within the multilateral trade system, notably in the SPS and TBT Agreements²⁴. These two new agreements, venturing into “behind the border” regulatory obstacles, contain a scientific discipline aimed at the prevention of technical legislation which is intended for the protection of human health or safety; the protection of the health or life of humans, animals, or plants; or consumer protection against deceptive practices and environmental protection from being used to create or from resulting in unjustified barriers to international trade²⁵. While the TBT refers to science exclusively as one of the elements to be “considered” in assessing the ‘proportionality’ of a contested measure, without providing for an explicit obligation of risk assessment²⁶, the SPS requires Member States to base their measures on science, by clearly delineating their scientific rationale.

The following section will briefly illustrate what are the requirements of the SPS Agreement with respect to science.

2.3. Conclusions

This overview of the genesis of the GATT/WTO scientific justification discipline clearly shows that the SPS Agreement is the only WTO instrument that expressly imposes on its Members the requirement of basing their measures on scientific evidence²⁷. It is this agreement that has provided some of the vocabulary for and the basic normative foundations of the WTO risk analysis, thus establishing a multilateral framework of rules and disciplines for the development, adoption and enforcement of SPS measures in order to minimize their negative effects on trade.

3. The scientific discipline in the SPS Agreement

The SPS Agreement’s scientific discipline builds upon four key science-based provisions. In particular, the primary scientific justification requirement may be found in Article 2.2 SPS. That Article requires that any Member States’ sanitary and phytosanitary measure be “based on scientific principles and [...] not [be] maintained without sufficient scientific evidence” and be the least-trade restrictive solution available.

²⁴ For a detailed analysis of negotiation history of these agreements, D.A. Motaal, *The Multilateral Scientific Consensus and the World Trade Organization*, *Journal of World Trade*, 38(5):855-876, 2004, [who reminds that the concept of science has implicitly been introduced for the first time already in the 1980 Tokyo Round Agreement on Technical Barriers to Trade (Art. 14 referred to “detailed scientific judgments involved)].

²⁵ Since the 1979 Tokyo Round some countries feared that the lowering of border measures would be circumvented by disguised protectionist measures in the form of technical regulations, notably sanitary and phytosanitary regulations. For this reason, already on that occasion, a Plurilateral Agreement was adopted on Technical Barriers to Trade, also called “Standards Code”. See M. Trebilcock and R. Howse, *The Regulation of International Trade*, London-New York, Routledge, 1999, p. 145. See also S. Marceau and J. Trachtman, *The Technical Barriers to Trade Agreement, the Sanitary and Phytosanitary Measures Agreement, and the General Agreement on Tariff and Trade, A Map of the World Trade Organization Law of Domestic Regulation of Goods*, pp. 811-881.

²⁶ Article 2.2 TBT states that different justifications of a TBT measures can include, inter alia, “available scientific and technical information, related processing technology or intended end-uses of products”.

²⁷ This has been expressly recognized by the same Panel in the Asbestos case. See Panel Report, para 8.180. The only difference between justification under Article XX (b) and the scientific evidence requirement in the SPS text is that while under Article XX the defendant bears the burden of proof for justifying its measure, under the SPS it is the plaintiff that has to raise at least a presumption that the contested measure is not based on scientific evidence.

Article 5.1 SPS translates this duty into operational terms by dictating that countries should ensure that their measures are "based on an *assessment*, as appropriate to the circumstances, of the risks to human, animal or plant life or health". Although it has been universally recognised that there is a close relationship between Article 5.1 and 2.2²⁸, the exact nature of that relationship is not clear.

Article 5.7, referred to in Article 2.2, authorises a departure from the previous two provisions, permitting the adoption of provisional measures in a situation of insufficient scientific evidence²⁹. Finally, Article 3.3 authorises Members to refrain from basing their measures on international standards, if, inter alia, there is a scientific basis, for doing so. This article would apply in a case in which, on the basis of available scientific information, a WTO member determines that the relevant standards are not sufficient to achieve the appropriate level of protection. This mechanism has effectively been defined as a "refined system of applied subsidiarity, subtly allowing national autonomy subject to certain constraints"³⁰.

The focus of this paper will be mainly on the risk assessment requirement as enshrined in Article 5.1. This is justified by the fact that the WTO judicial bodies have systematically begun, with the notable exception of *Japan-Agricultural products* and *Japan-Apples*, an analysis of the scientific justification requirement from Article 5, then concluded that Article 2.2 should also be considered to have been violated if the former has been breached³¹.

4. Article 5.1: The Risk Assessment requirement

In order to fully satisfy the scientific justification discipline provided by the SPS Agreement, SPS measures must comply with Article 5.1 SPS. This provision provides that Member States should ensure that their measures are "based on an *assessment*, as appropriate to the circumstances, of the risks to human, animal or plant life or health". This requirement translates to operational terms the scientific duty imposed on Member States by Article 2.2, thereby completing the SPS scientific discipline. In particular, by laying down some common structure for the way in which WTO Members enact SPS measures, it constitutes an attempt by the SPS framers to provide some guidance to the Member States when adopting such measures. As noted by the Panel in *EC-Biotech*, to determine whether there is a violation of Article 5.1, two distinct issues must be addressed:

- whether there is a 'risk assessment' within the meaning of the SPS Agreement (section 4.1); and
- whether the SPS measure at issue is 'based on' this risk assessment (section 4.2)³².

²⁸ See, e.g., EC-Hormones, AB Report, para 180.

²⁹ "[i]n cases where relevant scientific evidence is insufficient, a Member may provisionally adopt sanitary or phytosanitary measures on the basis of available pertinent information, including that from the relevant international organizations as well as from sanitary or phytosanitary measures applied by other Members. In such circumstances, Members shall seek to obtain the additional information necessary for a more objective assessment of risk and review the sanitary or phytosanitary measure accordingly within a reasonable period of time".

³⁰ J.P. Trachtman, *The World Trading System, the International Legal System and Multilevel Choice*, 12 *European Law Journal* 469 (2006), p. 480.

³¹ Following *Japan-Apples*, there are signs in the WTO case law indicating a shift of attention away from consistency with Article 5.1 towards consistency with Article 2.2. It remains to be seen, however, whether this is enough to argue that these provisions, by giving rise to two separate sets of obligations, may lead to a (not yet seen) scenario where an SPS measure, though found to satisfy Article 5.1, may ultimately be found to be in breach of Article 2.2.

³² EC-Biotech, panel report, para 7.3019.

4.1 What constitutes a risk assessment under Article 5.1?

In the first SPS case, *EC-Hormones*, the panel described risk assessment as a “scientific process aimed at establishing the scientific basis for the sanitary measure a Member intends to take”³³. The Appellate Body understood the panel to refer to “a process characterised by systematic, disciplined and objective enquiry and analysis, that is, a mode of studying and sorting out facts and opinions”³⁴.

The concept of "assessment of the risks" is laid down in Annex A to the SPS. This provides for two different definitions of assessment of risks to the life and health of humans and animals, depending on the nature of the risks at stake:

- for risks associated with **pests or diseases**, the required assessment is defined as “the evaluation of the *likelihood* of entry, establishment, or spread of a pest or disease within the territory of an importing Member according to the sanitary and phytosanitary measures which might be applied”.
- for risks arising from the **presence of certain substances** in food, beverages and feedstuffs, the required assessment consists of an “evaluation of the *potential* for adverse effects on human or animal health arising from the presence of additives, contaminants, toxins, or disease-causing organisms in food beverages or feedstuffs”.

The DSB tends to heavily rely on these definitions and their constituent units in order to assess whether a Member’s risk assessment satisfies Article 5.1 SPS. As a result, both types of risk assessment have been interpreted and developed further by the WTO judicial bodies. In particular, the quarantine risk assessment is a three-step analysis whereas food-borne risk assessment is a two-step process. In the former risk assessment type (quarantine, pest and disease), the first step consists in identifying "the diseases (or pests) [...] as well as the potential biological and economic consequences associated with the entry, establishment or spread of these diseases"³⁵. Once the quarantine risks are identified the Members must assess "the likelihood of entry, establishment or spread of these diseases, as well as the associated potential biological and economic consequences"³⁶. Finally, a risk assessment must "evaluate the likelihood of entry, establishment or spread of these diseases according to the SPS measures which might be applied"³⁷. In *Japan-Apples* the panel, as subsequently confirmed by the AB, further clarified this last step of quarantine risk assessment by requiring consideration of not only "the particular measures that are already in place to the exclusion of

³³ EC-Hormones, AB Report, para 187 (quoting panel report, EC-Hormones (US), para 8.107; and panel report, EC-Hormones (Canada), para 8.110).

³⁴ EC-Hormones, AB Report, para 187. For an overview of this longstanding case, see, e.g., M.M. Slotboom, *The Hormones Case: An Increased Risk of Illegality of Sanitary and Phytosanitary Measures*, *Common Market Law Review* (1999) 486; D. Wüger, *The Implementation Phase in the Dispute Between the EC and the United States on Hormone-Treated Beef, Law and Policy in International Business*, pp. 777 ss. (2002) and for a follow-up of the case, see A. Alemanno, *Judicial Enforcement of the WTO Hormones ruling within the European Community: Toward an EC Liability for the non-implementation of WTO Dispute Settlement Decisions*, 45 *Harvard International Law Journal* 547 (2004). In February 2005, at the request of the European Communities (EC), a panel has been established to determine the WTO-consistency of the continued retaliation by the United States and Canada, despite EC claims of compliance with the findings in the *European Communities - Hormones* dispute. See *United States/Canada: Continued Suspension of Obligations in the EC Hormones Dispute*, WT/DS320 and WT/DS321.

³⁵ *Australia-Salmon* AB Report, para 120.

³⁶ *Australia-Salmon* AB Report, para 120.

³⁷ *Australia-Salmon* AB Report, para 120.

other possible alternatives", but also consideration of the measures which "might be applied", i.e. the measures which may potentially be applied³⁸.

In the latter definition of risk assessment³⁹, the first step consists in the identification of adverse effects to human or animal health and life arising from the presence of certain substances, such as toxins or additives, in food, beverages, and feedstuffs. When such adverse effects exist, the second step requires an evaluation of the potential or probability of occurrence of these effects. This two-step analysis seems to be settled case law, even though the AB had initially expressed some doubts by describing it "debatable" in the *Hormones* case⁴⁰.

(a) *Probability versus Possibility?*

It follows from a reading on the two different definitions contained in Annex A that each type of risk assessment calls for its own level of "likelihood". In particular, while quarantine risk assessment requires an evaluation of *likelihood*, in the case of food-borne risk, Annex A only refers to an "evaluation of the *potential* for adverse effects on human or animal health".

Although it is doubtful that the SPS drafters deliberately created this semantic differentiation, the AB, being traditionally attentive to textualism in the exercise of its interpretative task, has attributed the full meaning of this differentiation, by equating likelihood with probability and potential with mere possibility⁴¹.

This has been confirmed by the AB in *Australia-Salmon* where it held that

"[...] for a risk assessment to fall within the meaning of Article 5.1 and the first definition in paragraph 4 of Annex A, it is not sufficient that a risk assessment conclude that there is a *possibility* of entry, establishment or spread of diseases and associated biological and economic consequences. A proper risk assessment of this type must evaluate the "likelihood", i.e., the "probability", of entry, establishment or spread of diseases and associated biological and economic consequences as well as the "likelihood", i.e., "probability", of entry, establishment or spread of diseases *according to the SPS measures which might be applied*"⁴².

It results from this that, according to the WTO judicial bodies, the quarantine risk assessment requires a higher level of probability than the food-borne type, by introducing – as recognised by the same AB – a "quantitative dimension to the notion of risk"⁴³.

But even if the differentiation proposed by the AB between the different levels of "likelihood" required for the two types of risk assessment has a solid textual basis within the SPS Agreement, doubts remain as to whether the introduction of such a distinction is either scientifically or politically justified. As both types of risk assessment deal with risks that, though originating from different sources, endanger the same essential values, such as the life

³⁸ Japan-Apples Panel Report, para 8.283.

³⁹ EC-Hormones Panel Report, para 8.98.

⁴⁰ EC-Hormones AB Report, para 184.

⁴¹ EC-Hormones AB Report, para 184; Australia-Salmon AB Report, para 123.

⁴² Australia-Salmon AB Report, para 123.

⁴³ EC-Hormones AB Report, para 184.

and health of humans and animals, it is hard to find persuasive reasons legitimising this differentiation⁴⁴.

Yet the *EC-Biotech* case has recently shown that such a higher level of probability still exists and that can produce relevant consequences for the responding party in an SPS dispute. In order to justify its safeguard measure on T25 maize, Austria relied on several scientific studies proving its concerns over inter alia the spread of pollen to cultivated surrounding fields (the “Reasons document”) and long-term ecological effects (the “Hoppichler study”) stemming from cultivation of this GMO. However, given the lack of evaluation of likelihood in both studies, the panel considered that these reports did not meet the definition of risk assessment as provided in Annex A(4), and therefore did not constitute a risk assessment within the meaning of Annex A(4) and Article 5.1. Indeed on the one hand, “[...] the Reasons document includes references to possibilities of associated risks, but it does not provide an evaluation of the likelihood of such risks occurring”, and on the other hand, “the Hoppichler study does not indicate relative probability of the potential risks it identifies, but rather makes reference to possibilities of risks or simply to the inability to determine probabilities”⁴⁵.

It seems that behind the different terminology used for the two definitions of risk assessment there lay the SPS drafters’ intention to set a lower threshold of “likelihood” to satisfy the risk assessment requirement in cases where human health is more likely to be at risk, i.e. when food safety is at issue. However, it has since become evident that also pests and diseases that affect plants and animals, such as avian flu and BSE, may also affect human health⁴⁶. Therefore, the rationale for attributing normative values to either side of the semantic differentiation contained in the two definitions of risk assessment under the SPS Agreements seems to be called into question today.

(b) Minimum magnitude of risk

According to the Appellate Body, a risk assessment doesn’t need be expressed in numerical terms or as a minimum quantification of the level of risk⁴⁷. Therefore, in principle, any ascertainable risk, no matter how small, may justify the adoption of an SPS measure and no negligible *de minimis* risks would exist under the Agreement.

However, this conclusion was reached in *EC-Hormones*, a case relating to food-borne risk. As previously illustrated, in this kind of risk assessment, the word “potential” was interpreted as mere possibility, which does not require quantitative figures. However, for a quarantine disease, it seems that an assessment needs to produce quantitative estimates of the probability of risk occurrence. Although this does not mean that qualitative elements cannot appear in a quarantine risk assessment, there is – as illustrated in *Japan-Apples* – a higher threshold to be met in such a case. However, the level at which this epistemic threshold is set remains unclear, and no Member State seems to have satisfied it thus far.

(c) Specificity of Risk Assessment

⁴⁴ L. Gruszczynski, Science in the Process of Risk Regulation under the WTO Agreement on Sanitary and Phytosanitary Measures, German Law Journal, Vol. 7 No. 4, April 2006.

⁴⁵ EC-Biotech, paras 7-3041 and 7. 3044.

⁴⁶ D. Prévost, Balancing Trade and Health in the SPS Agreement, The Development Dimension, Wolf Legal Publisher, 2009, p. 648.

⁴⁷ EC-Hormones, AB Report, para 186; Australia-Salmon, AB Report, para 124; US-Continued Suspension, AB Report, para 569.

According to the AB, risk assessment – regardless of whether it falls within the first or second definition of Annex I –, needs to be specific⁴⁸. Indeed, in interpreting both definitions of risk assessment, the DSB has emphasised the need to produce “sufficiently specific” evidence of the risk at hand. As applied in *EC-Hormones*, the AB rules that the EC’s ban did not satisfy Art. 5.1 because the studies submitted by the EC were considered to be insufficiently specific. Although the AB recognised that these studies “show the existence of a general risk of cancer”, it concluded that “they do not focus on and do not address the particular kind of risk here at stake”: the carcinogenic potential, not of the relevant hormones in general, but of “residues of those hormones found in meat derived from cattle to which the hormones had been administered for growth promotion purposes”⁴⁹. In other words, those general studies are “relevant but do not appear to be sufficiently specific to the case at hand”⁵⁰. Similarly, in *Japan-Apples*, the AB established that “a risk assessment should refer in general to the harm concerned as well as to the precise agent that may possibly cause the harm”⁵¹. On this basis, it concluded that Japan’s risk assessment (the 1999 PRA) insufficiently analyzed the “probability” and “pathways” when considering the likelihood of entry, establishment, or spread of fire blight. In particular, it failed “to evaluate the entry, establishment or spread of fire blight through apple fruit as a separate and distinct vector”⁵².

The immediate consequence of the adoption of such an approach is to considerably reduce the right of WTO members, such as it is enshrined in the SPS Agreement, to regulate any ascertainable risk and establish any level of protection they deem appropriate. In particular, by requiring a “sufficiently specific” assessment, the DSB renders almost illusory regulatory action vis-à-vis low-level exposure risks. These situations are characterised by being insusceptible to rigorous demonstration. Thus, in the *Hormones* case, the EU scientific studies showed that the hormones in question were known carcinogens and that some residue of these hormones exist in the meat, but could not show with any degree of statistical confidence whether these small residues, when added to the diets of people who are exposed to the same hormones from many other sources (and of course other carcinogens) do or do not cause a few more cases of cancer⁵³. As was recently observed by one of the experts advising the panel in *US – Continued Suspension*, “the risk from low level exposure would be such that it would be necessary to study extremely large populations to detect any increase in cancer incidence”⁵⁴. In these circumstances, the lack of a set of (epidemiological) data makes it impossible for the responding Member to satisfy Article 5.1. Although the AB, in the same case, has recognised that, “where a substance may be potentially toxic, requiring a WTO member to evaluate *specifically* the risks through actual consumption of the substance would be unethical” it then strenuously defended its narrow reading of the definition of risk assessment in paragraph 4 of Annex A⁵⁵ by rejecting all of the EC Commission’s arguments relating to the specificity requirement. As it has been observed “the AB’s insistence [in *EC-*

⁴⁸ Although the specificity requirement is usually checked as part of the analysis as to whether there is risk assessment, it can also be considered in the DSB’s adjudicative practice the subsequent analysis of whether the contested measure is “based on” risk analysis.

⁴⁹ *EC-Hormones*, AB, para 200.

⁵⁰ *Ibid.*

⁵¹ *Japan-Apples*, AB Report, para 202.

⁵² *Japan-Apples*, AB, para 200.

⁵³ A.O. Sykes, *Domestic Regulation, Sovereignty, and Scientific Evidence Requirements: A Pessimistic View* (2002) *Chinese Journal of International Law* 353, p. 364.

⁵⁴ In this follow-up dispute of the *Hormones* case, the question was whether the continued suspension of concessions by the US and Canada against the EC for non compliance with *EC-Hormones* was illegal, due to the fact that the new EC scientific studies represented a risk assessment justifying to maintain the ban on hormones-beef.

⁵⁵ *US-Continued Suspension*, AB report, para 563.

Hormones] that Europe point to highly particularised studies showing a risk from hormone residues in meat likely represents an insurmountable hurdle”⁵⁶.

(d) Factors to be taken into account in Risk Assessment

A list of factors that must be taken into account when conducting an assessment of risk is provided in Article 5.2⁵⁷. The list begins with “available scientific evidence” and also includes: “relevant processes and production methods; relevant inspection, sampling and testing methods; prevalence of specific disease or pests; existence of pest- or disease-free areas; relevant and ecological conditions; and quarantine and other treatment”. Art. 5.3, which applies only to risks to animal or plant life or health, supplements that list with economic factors (e.g. the potential damage in terms of loss of production and sale in the event of the entry of a pest). In *EC-Hormones*, the AB interpreted the former list as non-exhaustive⁵⁸ and as including non-scientific factors as well⁵⁹.

However, this last point is quite controversial among commentators not only because of the blurred nature of the factors listed in Article 5.2⁶⁰ but also because of the ambiguous character of the famous sentence employed by the AB to describe the kind of risk ascertainable under Article 5.1⁶¹. Notably the AB stated 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 risks 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”⁶².

Indeed, while it is objectively true that the factors listed in Article 5.2 are not “wholly susceptible of investigation according to laboratory methods”⁶³, the AB’s allusion to “the risks in human societies as they actually exist”⁶⁴ did not necessarily “open the door to the inclusion of such factors as cultural preferences and societal values in the risk assessment for SPS measures”⁶⁵. It is indeed arguable whether the AB’s statement may offer sufficient foundation for the conclusion that it is possible to take into account non-scientific factors within risk

⁵⁶ A. Sykes, *Domestic Regulation, Sovereignty, and Scientific Evidence Requirement: A Pessimistic View*, *Chicago Journal of International Law*, Vol. 3, pp. 363-4.

⁵⁷ The recent *US-Continued Suspension*, Panel Report, para 7.441, has established that the function of this provision is not only informative but it requires WTO Members to consider all the factors enumerated in Article 5.2

⁵⁸ AB Report in *EC-Hormones*, para 187 (“[...] there is nothing to indicate that the listing factors that may be taken into account in a risk assessment of Article 5.2 was intended to be a closed list”).

⁵⁹ AB Report on *EC-Hormones*, para 187.

⁶⁰ AB Report in *EC-Hormones*, para 187 (“[...] [s]ome of the kinds of factors listed in Article 5.2 such as ‘relevant processes and production methods’ and ‘relevant inspection, sampling and testing methods’ are not necessarily or wholly susceptible of investigation according to laboratory methods of, for example, biochemistry or pharmacology [...]).

⁶¹ For a criticism of this statement see, ex multis, R. Quick and A. Bluthner, *Has the Appellate Body Erred? An Appraisal and Criticism of the Ruling in the WTO Hormones Case*, supra note 743, pp. 618-9. For a positive comment see R. Howse, *Adjudicating Legitimacy and Treaty Interpretation in International Trade Law: The Early Years of WTO Jurisprudence*, in J.H.H. Weiler, (ed.), *The EU, the WTO and the NAFTA: Towards a Common Law of International Trade?*, Oxford University Press, 2000, pp. 64 ss.

⁶² *EC-Hormones* AB Report, para 187.

⁶³ AB Report on *EC-Hormones*, para 187.

⁶⁴ AB Report on *EC-Hormones*, para 187.

⁶⁵ R. Neugebauer, *Fine-Tuning WTO Jurisprudence and the SPS Agreement: Lessons from the Beef Hormones Case*, 31 *Law & Policy International Business* 1255, p. 1267 (2000).

assessment. In fact, the language employed by the SPS when sketching out its scientific discipline is rigorously and exclusively science-based and does not leave any room for non-scientific considerations, apart from the reference to “relevant economic factors” contained in Art. 5.3 (which refers only to animal or plant risk)⁶⁶. Thus, for instance, Annex A, defining risk assessment, does not recognise, either in the identification phase or in the evaluation of likelihood of adverse effect, any role to non-scientific considerations.

The case law has interpreted Articles 5.2. and 5.3 SPS as procedural standards. As a result, Member States are required to ‘take into account’ these factors but there is no corresponding obligation that the final SPS measure ‘be based on’ or ‘conforms to’ these considerations⁶⁷.

4.2 When an SPS measure is “based on” Risk Assessment

Under Art.5.1, Member States are not only expected to show a risk assessment to support their measures, but they must also prove that their SPS measures are “based” on the results of risk assessment. As illustrated by *Australia-Salmon*, *Japan-Agricultural Products II*, and *Japan-Apples*, failing the scientific studies to qualify risk assessments within the meaning of Annex A.4, the SPS measures at issue cannot be “based on” a risk assessment⁶⁸.

(a) Procedural vs Substantive Requirement?

The meaning of the phrase “based on risk assessment”, as employed in Article 5.1, revealed to be difficult to interpret and was clarified by the AB in *EC-Hormones*⁶⁹. Although the panel in this dispute read in this requirement a “minimum procedural requirement”⁷⁰, the AB rejected this interpretation in the same dispute, by emphasizing the ‘substantive requirements’ that regulate the adoption of SPS measures, in particular that an SPS measure must be justified by science. The question is therefore not whether the drafter of the SPS measure took the risk assessment into account, but rather whether, objectively, there is a “certain objective rational relationship” between the risk assessment and the measure. According to the AB, “the results of risk assessment must sufficiently warrant – that is to say *reasonably* support – the SPS measure at stake”⁷¹.

Moreover, absent national procedural requirements, a Member may rely on a risk assessment conducted “by another Member, or by an international organisation”, and should therefore not

⁶⁶ This provision, by excluding human health factors, clearly prioritise human health above economic consideration when assessing risks. See D. Prévost, *supra* note 46, p. 664.

⁶⁷ US-Continued Suspension, para 7.481.

⁶⁸ Contrary to what it might be expected, compliance with this further benchmark for the legality of a SPS measure is not always checked after the analysis relating to the existence of a risk assessment. Thus, in *Japan-Apples*, the AB engaged into this inquiry earlier in the analysis when verifying the very existence of the risk assessment. This inevitably adds a further layer of intricacy in interpreting the risk assessment requirement under WTO law.

⁶⁹ This question arose in the first SPS case that reached the DSB: the *Hormones* case.

⁷⁰ The panel, after having found that “[...] there is a minimum procedural requirement contained in Article 5.1”, went on by stating that “[i]n our view, the Member imposing a sanitary measure needs to submit evidence that at least it actually took into account a risk assessment when it enacted or maintained its sanitary measure in order for that measure to be considered as based on risk assessment”. Concluding that the EC had not met its burden of proving that it had satisfied such a “minimum procedural requirement” stemming from Article 5.1, the Panel found that the EC measures inconsistent with the requirements of Article 5.1. See *EC-Hormones* Panel Report, para 8.113.

⁷¹ *Hormones*, AB Report, para 193.

necessarily carry out its "own risk assessment"⁷². However, the increasing demand for specific risk assessment puts a limit on the extent to which WTO Members may rely on risk assessment conducted by other countries or international bodies⁷³. It seems indeed very difficult to identify a risk assessment conducted by another member or international body which could easily meet the specificity requirement.

(b) Is an SPS measure "based on risk assessment" when it relies on Minority Opinions?

An SPS measure need not "come to a monolithic conclusion that coincides with the scientific conclusion or view implicit in the SPS measure" nor does the risk assessment have to "embody only the view of a majority of the relevant scientific community"⁷⁴. Although recognizing that "[i]n most cases, responsible and representative governments tend to base their legislative and administrative measures on "mainstream" scientific opinion", the AB has observed that "[i]n other cases, equally responsible and representative governments may act in good faith on the basis of what, at a given time, may be a divergent opinion coming from *qualified and respected sources*"⁷⁵. It then also added that an approach based on a divergent opinion, "by itself, this does not necessarily signal the absence of a reasonable relationship between the SPS measure and the risk assessment, especially where the risk involved is life-threatening in character and is perceived to constitute a clear and imminent threat to public health and safety"⁷⁶.

Therefore, according to the AB's judicial interpretation, risk assessment, as enshrined in Article 5.1, would not be confined to majority scientific opinions but may also include minority views, i.e. the opinions of scientists departing from mainstream scientific thought. The abovementioned statement remains, however, quite controversial. This is because, although minority opinions have been recognised as valid elements to be taken into account in risk assessment, their contemplation has been subject to a "reliability/quality" condition (i.e. that they are "coming from qualified and respected sources"). Thus, on these grounds, the "single divergent opinion" of Dr. Lucier has been rejected as being "not reasonably sufficient to overturn the contrary conclusions reached in the scientific studies", particularly because these "other studies" are more specific. While this interpretation seems to reasonably impose that minority opinions be adequately supported by sufficient evidence, it also suggests that, when a measure is based on minority scientific opinion, the required relationship between that measure and its scientific basis is susceptible to particularly strict scrutiny.

It is believed that this approach is likely to render illusory the integration of minority opinions within risk assessment to the extent that those opinions, unlike mainstream science, tend to be based "in the kind of suggestive but not definitive scientific evidence that qualifies as "general" (or "indirect") scientific evidence in the scheme of WTO decision-makers"⁷⁷. However, given that the issue of the legal status of minority scientific opinions within risk assessment is still an open question, it remains to be seen whether future cases will clarify it by giving full meaning to the vague notion of "qualified and respected sources".

⁷² Hormones, AB Report, para 190. See also EC-Biotech, Panel Report, para 7.3015, where it is said: "[t]hus, an SPS measure may be based on risk assessment conducted by another Member or by an international organisation".

⁷³ See C. Button, *The Power to Protect*, Oxford and Portland, Oregon, 2004, p. 67.

⁷⁴ Hormones, AB Report, para 194.

⁷⁵ *Ibid.*

⁷⁶ *Ibid.*

⁷⁷ J. Peel, *Risk Regulation Under the WTO SPS Agreement: Science as an International Normative Yardstick?*, Jean Monnet Working Paper, 02/04, NYU School of Law, p. 66.

(c) Rational relationship under Art. 5.1: towards a Proportionality review?

How close must the measure be to the risk assessment in order to be sufficiently supported or reasonably warranted by that risk assessment?

As panels may choose to commence their analysis with any of the breaches alleged by the complainant, they traditionally examine whether the studies supporting the contested measure amount to a "risk assessment" under Article 5 SPS. In doing so, they verify whether enough "available scientific evidence" has been taken into account in the risk assessment to fulfill the "sufficient evidence" requirement imposed by Article 2.2 SPS. Yet, in *Japan-Apples*, following the precedent in *Japan-Agricultural Products*, the panel, then upheld by the AB, directly assessed the sufficiency of the scientific underpinnings of the Member's risk regulatory measures rather than coming to this question through an analysis of its role as part of the process of risk assessment for the Member's regulation. In other words, the panel, instead of looking at scientific evidence as a part of the process of risk assessment under Article 5.1, focused on what might count as science within the meaning of Article 2.2 SPS⁷⁸.

In this case, on the specific scientific issue as to whether a mature, symptomless apple could harbour endophytic bacteria⁷⁹, the panel, since the scientific opinions brought by the US and Japan were divergent, turned to the opinion of its own experts to reach a conclusion. By endorsing its experts' opinions⁸⁰, the panel dismissed the scientific validity of the study by Dr. van der Zwet et al. cited by Japan, by criticizing not only its methodology (this study "did not specify the degree of maturity of the fruit") but also its results they reached ("this made its conclusions confused, difficult to interpret or even unconvincing")⁸¹. After having fully engaged in such a scientific debate, the panel concluded by stating that

"[...] on the basis of the elements before us, there was not sufficient scientific evidence to support the view that apples are likely to serve as a pathway for the entry, establishment or spread of fire blight within Japan".

This conclusion was reached notwithstanding the fact that "some slight risk of contamination cannot be totally excluded"⁸². However, as "the experts all categorized the risk *as negligible*", the panel denied the scientific evidence brought by Japan the qualification of "sufficient" within the meaning of Article 2.2 SPS, thus condemning the Japanese measures at stake. Indeed, according to the panel, as the risk was negligible, the contested measure was found to be disproportionate to the declared objective.

In so doing, contrary to what was expressly stated by the panel in the *Asbestos* case, the panel, though relying heavily on its experts' opinions, undoubtedly acted as "an arbiter of the opinions expressed by the scientific community"⁸³. It assessed not only the quality of the

⁷⁸ Apples, Panel Report, para 8.92.

⁷⁹ In other words, whether a mature, symptomless apple could harbour bacteria inside the fruit without itself being infected.

⁸⁰ It is worth noting that, on that specific controversial scientific issue, only one of the Panel experts (Dr. Smith) expressly criticized the study (as "not convincing in several aspects") cited by Japan, by van der Zwet. See paras 6.72-6.75.

⁸¹ Japan-Apples Panel Report, para 8.127.

⁸² Japan-Apples Panel Report, para 8.173.

⁸³ EC-Asbestos, Panel Report, para 8.181. In this case the panel, before analyzing whether the French ban on asbestos products could be justified under Article XX GATT, declared that "its role [...] is to determine whether there is sufficient scientific evidence to conclude that there exists a risk for human life or health" and not to "set itself up as an arbiter of the opinions expressed by the scientific community".

scientific studies brought before it, but also set up a "minimal" level of risk (more than "negligible") justifying the adoption of an SPS measure.

The introduction of a proportionality test risks leading the WTO judicial bodies to second-guess the judgments of the national risk managers as to which risks to regulate and what level of protection to apply. The interpretation given seems to be heavily influenced by an understanding of the SPS scientific discipline, not only as a shield against sham health measures having a discriminatory impact on trade, but also as a sword to promote of efficient and rational risk regulations among WTO Members. But is this the goal pursued by the SPS scientific discipline? This question will be addressed later.

5. Risk Assessment as *probatio diabolica*

Despite numerous statements by the AB expressing deference vis-à-vis Member States autonomy and conveying acceptance of qualitative approaches to risk assessment as well as minority opinions, our analysis has shown that the risk assessment requirement has been construed in a rather narrow manner. First, the two definitions of risk assessment (quarantine risk vs food-borne risk) foreseen in Annex A have been interpreted as requiring two different levels of "likelihood". On the one hand, following the AB's equation of "likelihood" and "probability", a quarantine risk assessment must not only measure the potential for but also the probability of adverse risk to satisfy Article 5.1. As noted by the AB in *EC-Hormones*, this inevitably introduces a quantitative dimension in the assessment of quarantine risks⁸⁴, but it remains unclear how, in the absence of a minimum threshold of risk, this requirement could be satisfied. On the other hand, a food borne risk assessment could theoretically show mere possibility and pass muster with a qualitative mode of assessment. Yet, under the actual case law, both kinds of assessments will have to be "sufficiently specific" to the matter at hand⁸⁵. This specificity requirement translates into a duty to advance positive evidence, precisely tailored to the problem at hand, of the existence of a risk, thus limiting the ability of Members to counteract all categories of risk which are merely theoretical (not ascertainable under scientific methods). This may be problematic to the extent that science and its scientific methods may often fail to produce statistically convincing studies of a risk which, should it prove to be genuine, would then warrant regulatory action.

Moreover, although the parties to a dispute may rely upon minority opinions which would therefore constitute a risk assessment, the case law requires that minority opinions fulfil a certain scientific quality. In practice, reliance on these opinions is rendered illusory by the case law to the extent that they often rely on less developed scientific studies, which are unlikely to meet the specificity requirement. Likewise, due to the controversial relationship between Article 5.1 and 2.2, the concept of a measure "based on a risk assessment" is not entirely clear and would seem to open the door to a proportionality scrutiny, which would be difficult to reconcile with the right to ALOP.

As a result of the above, the risk assessment inquiry as conducted today by the DSB threatens, and often renders nugatory, the recognition of Member States' right to establish the level of protection they deem appropriate, particularly in low-risk situations. As

⁸⁴ EC-Hormones AB Report, para 184.

⁸⁵ As observed by J. Scott, "Even a probability assessment will not pass muster except in so far it is sufficiently specific to the problem at hand", p. 137. See J. Scott, *The WTO Agreement on Sanitary and Phytosanitary Measures*, 2007, Oxford,

observed by Sykes, this outcome “clashes with the notion that WTO law is not meant to tell members states which risks they must tolerate and which risks they may elect to avoid”⁸⁶.

All in all the risk assessment inquiry amounts to a *probatio diabolica* for the responding party. Yet, as illustrated by the SPS dispute record (in which no responding country has ever managed to satisfy this requirement), this result is due more to the manner in which the risk assessment requirement has been interpreted, rather than to the way in which the burden of proof has been allocated⁸⁷. Indeed, under the rules for the standard of proof applicable under the SPS, while the complaining party has to establish a *prima facie* case (that the SPS measure is not based on a risk assessment)⁸⁸, the responding party must adduce positive evidence of the existence of risk and this evidence must be of a kind which is precise of the problem at hand. The bottom line is that unless something is proven unsafe, its inherent potential hazard won't hurt. As illustrated above, that's where the *probatio diabolica* lies: in the production of such evidence. This will appear even truer after analysing how the WTO judicial bodies approach the issue of judicial review of the SPS measures.

6. The Judicial Review of the risk assessment requirement and the role of experts

The scientifically demanding reading of the risk assessment requirement has inevitably produced the effect of making the WTO judicial bodies increasingly enmeshed with the scientific evidence advanced by the parties to the dispute. This is not surprising as the stricter the standard the heavier the scrutiny. Yet this result has been further aggravated by the standard of review applicable in proceedings under the SPS Agreement.

The standard of review, by determining the extent to which the WTO adjudicators are entitled to interfere in Member States' regulatory determinations, plays a determinant role in the allocation of authority over the trade/health interface⁸⁹. Despite its importance, neither the DSU nor the SPS Agreement prescribes a particular standard of review for panels deciding upon the legitimacy of a Member's SPS measures. When called upon to determine this question, the AB has systematically observed that, so far as fact-finding by panels is concerned, the applicable standard is “neither *de novo* review as such, nor ‘total deference’, but rather the ‘objective assessment of facts’ as foreseen in Article 11 DSU”⁹⁰.

According to the AB, this standard

“articulates with great succinctness but with sufficient clarity the appropriate standard of review in respect of both the *ascertainment of such facts* and the *legal characterisation* of such facts under the relevant agreement”.

⁸⁶ A.O. Sykes, Domestic Regulation, Sovereignty, and Scientific Evidence Requirements: A Pessimistic View (2002) Chinese Journal of International Law 353, p. 364.

⁸⁷ Scott, supra note 85, p. 132 (who argues that the difficulties faced by the responding Members, in refuting a *prima facie* case, are inextricably linked to the substance of the obligations which they incur).

⁸⁸ As established by the AB in EC-Hormones, “Only after such a *prima facie* determination had been made by the Panel may the onus be shifted to the European Communities to bring forward evidence and arguments to disprove the complaining party's claim”. Para 14.

⁸⁹ For an analysis of the standard of review applicable to SPS measures, see A. Alemanno, Trade in Food, p. 337-346; D. Prévost, supra note 46, p. 884- 897.

⁹⁰ EC-Hormones, AB Report, para 117.

Yet, as it was acutely observed, under these terms “there is very little room to understand decision-making as discretionary practice”⁹¹. Indeed, only two activities seem to deserve scrutiny: accurate fact-finding and correct application of the law to the facts.

As a result, despite relentless statements of principle showing deference⁹², panels, in applying the "rational relationship" test to verify the conformity of SPS measures to the WTO scientific justification discipline, tend to adopt a rather intrusive approach⁹³. By traditionally relying on advice from independent experts, panels, instead of assessing the compatibility of a national measure with the SPS Agreement, tend to assess its factual basis, thus turning a verification of compliance with the risk assessment requirement into an analysis of the evidence advanced by the parties. In particular, the WTO judicial bodies try to determine whether the scientific theory or risk assessment outcome put forward by a defending Member is properly backed up by the available scientific evidence.

In so doing, the panels have increasingly sparked scientific controversies, especially after the AB offered the following interpretation of the rational relationship test:

"[...] whether there is a rational relationship between an SPS measure and the scientific evidence is to be determined on a case-by case basis, and will depend upon the particular circumstances of the case, including the characteristics of the measure at issue and the *quality and quantity of the scientific evidence*"⁹⁴.

By referring to "the quality and quantity of the scientific evidence", the AB's elaboration of the rational relationship test inevitably opens up a Pandora's box of scientific discussion for the WTO judicial bodies, thereby legitimizing their involvement in controversial scientific matters.

Thus, in *Japan-Agricultural Products*, the panel has invested itself with the task of

"to *examin[ing] and weigh[ing]* all the evidence validly submitted to us, including the opinions we received from the experts advising the Panel in accordance with Article 13 of the DSU"⁹⁵.

This raises the broader question of whether adjudicators should engage with scientific controversies and what kind of use they should make of external advice. Article 11.2 SPS and Art. 13.1 of the DSU foresee the appointment of external experts, and virtually all SPS panels so far have consulted individual scientific experts (as opposed to expert review groups)⁹⁶. On a panel, the views of experts are non binding and are merely advisory. However, lacking a clear procedure laying down the modalities under which this consultation takes place, *ad hoc*

⁹¹ E. Fisher, *Risk Regulation and Administrative Constitutionalism*, Hart Publishing 2007, p. 184.

⁹² See, e.g., Article 21.5 Panel Report, *Japan - Measures Affecting the Importation of Apples*, WT/DS245/RW, para 8.137, where the panel has declared "[...] we are mindful that we are not supposed to conduct our own risk assessment or to impose any scientific opinion on Japan. Like the panels in *Australia - Salmon* and *Japan - Agricultural products II*, we will only examine and evaluate the evidence, including the information we have received from the experts advising the Panel, and the arguments put before us in light of the relevant WTO provisions".

⁹³ See, e.g., A. Guzman, *Food Fears: Health and Safety at the WTO*, in Boalt Working Papers in Public Law, 2004, who, after criticizing such an intrusive approach, makes a claim for a more deferential WTO review of SPS measures.

⁹⁴ *Japan - Agricultural Products AB Report*, para 84.

⁹⁵ *Japan - Agricultural Products*, Panel Report, para 7.10.

⁹⁶ *EC-Hormones*, para 6.10 ; *Australia-Salmon*, para 6.6 ; *Australia-Salmon (Art. 21.5- Canada)*, para 6.5; *Japan-Agricultural Products II*, para 6.4; *Japan-Apples*, para 6.4; *Japan-Apples (Art. 21.4 – Canada)*, para 6.2; *EC-Biotech*, para 7.25; *US-Continued Suspension*, para 7.86.

procedures have been established in each case following consultation with the parties to the dispute. Basically, the panels prepare questions and address them to the experts, in consultation with the parties. However, although their stated mission is to help the panel “understand and evaluate the evidence submitted and the arguments made by the parties”⁹⁷, the experts are often entrusted with a more cumbersome task: presenting a state of the art risk assessment of the issue at stake.

A recent example of all of this can be seen in *US-Continued Suspension*. Here, the panel, instead of limiting itself to determining whether the opinions of the SCVPH relied upon by the EC constituted a risk assessment within the meaning of Annexe A 4 and whether the EC’s measure was “based on” these opinions, addressed the question of whether the scientific evidence referred to in the Opinions “support the conclusions contained therein”⁹⁸. The question therefore became: to what extent does scientific evidence support the conclusions reached by the scientific opinion?⁹⁹ Recognising itself “not [to be] in a position to evaluate the scientific data the SCVPH reviewed in drawing its conclusions”, the Panel entrusted the appointed experts with the task of evaluating the science behind these opinions¹⁰⁰. By relying on the experts’ review of the science underpinning the SCVPH’s Opinions, the panel concluded that “the scientific evidence referred to in the Opinions does not support the European Communities’ conclusion that for oestradiol-17 β genotoxicity had already been demonstrated explicitly, nor does it support the conclusion that the presence of residues of oestradiol-17 β in meat and meat products as a result of the cattle being treated with the hormone for growth promotion purposes leads to increased cancer risk”¹⁰¹. The panel reached this conclusion notwithstanding the fact that there was a divergence of views between the EC and the US regarding the genotoxic potential.

This clearly shows how a scientifically demanding interpretation of the risk assessment requirement, combined with an intrusive standard of review (the focus is on the science supporting the Member’s scientific opinion), is a *de facto* trigger for a delegation of power to the experts, who, by acting as risk assessors on behalf of the panel, produce their own risk assessment for the panellists who are expected to review the scientific basis of a Member’s SPS measure. Due to the crucial value attached to the experts’ opinion, the final standard of review applied by the panel boils down to a *de novo* review. This outcome is favoured by the emphasis that the DSB places on fact-finding activity as opposed to the discretionary dimension of the decision-making process when interpreting the “objective assessment” standard. In embracing such an intrusive approach, the WTO judicial bodies pre-empt Member States’ evaluation of the results of scientific evidence in a way that reflects their own understanding of science. Indeed, when doing so, the WTO adjudicatory panels usurp the competence of Member States’ ability to conduct risk assessments, by going beyond the allowed “objective assessment” standard of review¹⁰². As illustrated above, they do so by evaluating the scientific evidence advanced by the parties and verifying on that basis whether the feared risk is ‘real’ (i.e. the likelihood or potential of the risk at issue).

7. When risk assessment becomes a *probatio diabolica* : toward ‘universal Cost-Benefit Analysis’?

⁹⁷ Japan-Agricultural Products, AB report, para 129.

⁹⁸ US-Continued Suspension, Panel Report, para 7.538.

⁹⁹ This may be inferred from *Ibid.*, para 7.570 and 7.572.

¹⁰⁰ *Ibid.*, para 7.553.

¹⁰¹ *Ibid.*, para 7.572.

¹⁰² Prévost, *supra* note 46, para 893.

Our analysis clearly shows that "compliance with Article 5.1" instead of being "a countervailing factor in respect of the right of members to set their appropriate level of protection"¹⁰³, is gradually becoming the dominant factor for establishing the legitimacy of an SPS measure with WTO law. As illustrated by the case law developed so far, the most immediate consequence stemming from the adoption of such a demanding approach to risk assessment is to place a heavy and insurmountable burden on the respondent party. This does not only impose a higher justificatory burden on WTO Members wishing to adopt measures aimed at protecting themselves from health risks but, conversely, it also makes it easier for potential complainants to challenge them¹⁰⁴. As illustrated above, this result is due more to the manner in which the risk assessment requirement has been interpreted, rather than to the way in which the burden of proof has been allocated¹⁰⁵. Oddly enough, after having contributed to the shaping of such a *probatio diabolica* through their interpretative activity, the WTO judicial bodies find themselves called upon to engage in complex scientific debates by not only assessing the quality of the scientific studies brought before them (and often the whole science behind the feared risk) but also by setting up a minimum level of risk which justifies the adoption of SPS measures. Such a growing engagement with scientific evidence begs the question of whether WTO panellists and AB Members and, more generally, international courts are adequately equipped for and epistemically capable of making such scientific judgments. As described above, with Article 5.1 reduced to an evidentiary requirement, virtually all SPS panels have relied heavily on external experts, sometimes going so far as to invest them with same legal question facing the panel.

Other relevant consequences stemming directly from the conduct of such risk assessment inquiry lie in the high demand for specificity in scientific assessment. As exemplified by *EC-Hormones*, by denying the inherent limits and complexities of the scientific method, the specificity requirement prevents Members States from acting against novel risk situations characterised by low certainty and high salience. This leads not only to the practical impossibility for Member regulation of low-risk situations in pursuance of their ALOP, but also renders illusory their judicially recognised right to rely on minority and divergent opinions, which, by definition, tend to refer to suggestive rather than to established evidence.

Yet the resulting interference in the exercise of the Member States' regulatory power when adopting SPS measures goes beyond even this already critical level. Indeed, such a strict risk assessment inquiry, by producing the effect of indiscriminately striking down all SPS measures which are scientifically unsupported, fails to do justice to the emerging category of measures that, although scientifically uncorroborated, do not pursue a protectionist goal. As the AB itself recognised in *EC-Hormones* when examining the EC ban on hormone-treated beef under Art. 5.5 SPS¹⁰⁶, this category of SPS measures may indeed exist. If a trade restrictive measure, such as the EC ban, is proven not to be protectionist, but based on other "externalities", such as consumer preferences, why should it be declared illegal? It might be problematic for a democratic system in which consumers have expressed a given preference to accept such an intrusive scrutiny in the name of free trade, especially when the contested measure does not even smell of discriminatory intent. If the purpose of the scientific discipline is merely to spot disguised restriction of trade, when filtering out protectionist

¹⁰³ EC-Hormones AB Report, para 177.

¹⁰⁴ See R. Howse and P.C. Mavroidis, Europe's Evolving Regulatory Strategy for GMOs – The Issue of Consistency with WTO Law: of Kine and Brine, 24 Fordham International Law Journal 317, at 320 (who note that the complainant has to merely raise a presumption that the Member's SPS measure is not based on scientific evidence).

¹⁰⁵ Scott, supra note 85, p. 132.

¹⁰⁶ EC-Hormones, AB Report, para 245 (under Art.5.5).

concerns from genuine health measures, non-discriminatory measures should not fall under the hammer of the risk assessment requirement. Yet this is exactly what occurs today.

It is submitted that in doing so, the DSB inescapably shifts the rationale of the risk assessment requirement from its original anti-protectionist goal to a new, more ambitious objective: to promote efficient and effective regulation. In particular, the introduction of a ‘proportionality’ test by the *Japan-Apples* panel seems to suggest a general willingness to move in this direction, by de facto introducing within the system “a form of cost-benefit analysis of universal applicability” to the system¹⁰⁷.

As a result, the scientific justification would not aim exclusively at eliminating sham health measures, but also at identifying scientifically unsupported regulations that, though not protectionist *per se*, may unnecessarily restrict trade. However, in principle, even though the promotion of international trade and the protection of human health are sometimes competing interests¹⁰⁸, the SPS Agreement does not require Members to apply a benefit-cost analysis (BCA) in order to strike a balance between these conflicting values. Thus, so long as an SPS measure is based on risk assessment, the fact that the measure’s costs exceed its net benefits should not amount to a breach of the Agreement¹⁰⁹.

8. Some Recommendations

In the absence of any less arbitrary alternative criterion, this paper argues that science could still play an important role in the international supervision of SPS measures. However, as illustrated above, if the scientific discipline constitutes a valuable constraint on protectionist non-tariff barriers, the trouble is that its rigid and scientifically demanding interpretation may go too far and limit the ability of WTO Members to regulate in a way that satisfies national priorities. Although the right to ALOP is not only textually enshrined in the SPS Agreement¹¹⁰ but has also been judicially recognised as the “prerogative” of any WTO Member¹¹¹, the DSB’s reading of the risk assessment requirement put that right into question. This tension is further accrued by the consequent intrusive role played by the WTO judicial bodies who, after having judicially construed a scientifically demanding risk assessment requirement, find themselves trapped in the difficult exercise of verifying whether a given SPS measure satisfies that requirement.

Therefore, to make the WTO scientific discipline, notably the risk assessment provision, a workable requirement, it is imperative to solve the existing tension between the actual risk assessment inquiry, as applied by the WTO judicial bodies, and the right to establish a level of protection which is deemed appropriate by a particular Member State.

As the scope of national regulatory autonomy is determined by the substantive disciplines negotiated, their interpretation and application, and the standard of review applied, any analysis aimed at transforming Article 5.1 into a workable requirement should focus on these three dimensions. Yet, as it is unlikely that WTO Members will negotiate a new SPS Agreement, our focus will be on the other two dimensions: the interpretation of the risk assessment requirement as well as its standard of review. It is argued that, taking the existing discipline as a basis, there is ample room for the DSB to develop an interpretative approach

¹⁰⁷ This expression belongs to J. Scott, *supra* note 85, p. 80.

¹⁰⁸ EC-Hormones, AB Report, para 117.

¹⁰⁹ Article 5.3 requires the risk assessors to take into account also “the cost-effectiveness of alternative approaches to limiting risks”, but only “in assessing the risk to animal or plant life or health”.

¹¹⁰ Preamble, Paragraph 5 of Annex A.

¹¹¹ Australia-Salmon, AB Report, para 199.

towards the scientific discipline so as to contribute to a system of review of science-based measures that ensures a better balance between international control and regulatory autonomy.

In the light of the above, here are some recommendations aimed at turning the risk assessment requirement from the current status of *probatio diabolica* to a workable requirement. Some of these recommendations find support in the recent AB Report in *US-Continued Suspension*.

A. To solve the ambiguity embedded in the rationale of the scientific discipline: is risk assessment a proxy for fighting protectionism or a tool for effective and rational regulation?

As illustrated above, much of the struggle in striking a balance between Member State autonomy and international supervision of risk regulation under the SPS derives from disagreement over the purpose of this Agreement. This explains why any exercise in reorientation in the interpretation and application of the risk assessment requirement should start from a clarification of its underlying rationale(s).

Depending on the purpose that interpreters have attached through time to the SPS Agreement through time, the risk assessment requirement has been the subject of different interpretations and, consequently, has triggered a more or less intensive standard of review. In particular most of the blame for the transformation of the risk assessment requirement into a *probatio diabolica* lies in an interpretation of the Agreement which saw in its scientific provisions not an anti-protectionist tool but rather an instrument for promoting rational decision-making in the risk regulation area. Starting from *Japan-Agricultural Products* and *Japan-Apples*, the WTO judicial bodies seem to have shifted the SPS's rationale from the battle against disguised protectionism towards the fight for efficient and rational risk regulation. Therefore the question that must be raised is the following: is the SPS Agreement trying to eliminate discriminatory trade measures only or is it also after non-discriminatory measures that do restrict trade?

The latter category is broader and, unlike the former, implies a market-opening agenda. Indeed, using science to enforce rational decision-making is a more ambitious goal than using it to fight protectionism. While the most recent judicial practice shows that this more ambitious goal is already on track, as exemplified by the proportionality test sketched out by the AB in *Japan-Apples*, the text of the SPS Agreement is more ambiguous about the rationale of its scientific discipline. There is indeed an unresolved tension between, on the one hand, the most immediate goal of fighting protectionism and, on the other, the more ambitious objective of injecting rationality in the risk regulation decision-making worldwide¹¹². The prospect of using science as a promoter of rationality in risk regulatory decision-making is extremely tempting as it would lead to dismantle trade barriers based on irrational fears and assumptions about health risks rather than facts. Thus, by embracing a significant, unlimited, market opening agenda, risk assessment, notably its underlying rational relationship test, would become a sort of universal cost-benefit analysis.

However, notwithstanding the attempts made by the DSS judicial bodies, it is doubtful whether the WTO could legitimately take up this duty, at least *de jure condito*. First, while it is true that the text of the Agreement is not particularly helpful in clarifying this issue, most of its provisions seem to hint to the fact that the SPS is mainly about preventing the proliferation of protectionism rather than about ensuring efficient regulation. Second, it would be difficult

¹¹² See, for instance, the emphasis on the harmonisation objective in both the preamble and Articles 3 and 4 SPS.

to justify the conferral of such an authority to the WTO because its members, unlike the US or the EU states, are not exercising any delegated powers and their health-protective actions do not undermine any overarching community-building agenda¹¹³. Third, the pursuit of this more ambitious goal would inevitably imply a heavier use of analytical tools and, as a result, the rejection of administrative discretion, thus further reducing Member States' ability to establish their level of protection¹¹⁴. Fourth, to engage in a rational-based scrutiny of national regulatory action would open up a Pandora's box and would immediately require the development of analytical tools which the judiciary could not easily apply. For the time being, an embryonic form of CBA (*rectius* cost-effectiveness) seems to be present only within the quarantine risk assessment definition where, assuming that risk assessment can help the risk manager to identify the effectiveness of different regulatory responses, there is an obligation to consider alternative policy options before choosing which regulatory action to adopt¹¹⁵. However, as long as an SPS measure is based on risk assessment (by procedurally complying with the abovementioned provisions), the fact that the measure's costs exceed its nets benefits would not seem to amount to a breach of the Agreement.

On balance, it may be best for the WTO to accept that its mission, as sketched out by the SPS Agreement, is limited to ensuring that protectionism does not proliferate and that clearly unnecessary health regulations are not allowed to restrict trade.

It is predicted that, should the SPS scientific discipline be understood, not to be a promoter of efficient regulation, but rather to be a proxy to fight disguised protectionism, this might pave the way for a new reading of the risk assessment requirement which embraces, as originally hoped for by the AB in *EC-Hormones*, a broader meaning, more respectful to the "risk in human societies as they actually exist". Indeed, if the purpose of the agreement is merely to fight disguised protectionism, this will inevitably induce the interpreter to recognise a greater margin for the exercise of Member State's discretion when adopting SPS measures. Conversely, as illustrated by the case law of the DSB, any reading of the risk assessment requirement as a tool aimed at promoting rational regulation throughout the world will inevitably defy Member States' discretion when adopting SPS measures. To sum up, having identified protectionism as the sole objective to be fought against via the SPS risk discipline, the interpreter will no longer have an incentive to promote a model of decision-making which is exclusively analytical and does not take discretion into account. On the contrary, there will a greater margin for an appreciation of the complexities of risk assessment and the challenges of scientific uncertainty.

But, what kind of reading and use of the risk assessment requirement should it be promoted? That's the question we will now address.

B. To develop a better scientific understanding: Less dictionary, more scientific language

If the risk assessment requirement, as judicially interpreted by the case law, amounts today to a *probatio diabolica* for the responding party, one may legitimately wonder whether the DSB could have realistically offered an alternative reading of this provision, within the broader

¹¹³ Button, *supra* note 73, pp. 223 – 234

¹¹⁴ Fisher, *supra* note 91, p. 183.

¹¹⁵ Japan-Apples Panel Report, para 8.283. Another procedural duty to take into account also economic considerations is foreseen in Art. 5.3, which does not apply though to human health risk but only to animal or plant life and health.

SPS framework. On the one hand, it is fully understandable that, if science is normatively expected to provide a useful benchmark against which to measure the legality of SPS measures, there is a need to interpret Art. 5.1 not as a mere procedural requirement but as a substantive obligation. This enables the interpreter to scrutinise whether the contested measure, being 'based on' risk assessment, conforms to WTO law. On the other hand, the scientifically demanding and rigid interpretation of the risk assessment requirement, by expecting risk assessments to act as the Oracle of Delphi in telling universal truths, does not do justice to the inherent limits of science and its increasingly sophisticated methods. As a result, there is a gap between the reading of the SPS scientific discipline and the risk assessment practice of national and international contexts.

(a) To train judges in the limitations of Risk Assessment methodologies and to make risk policies explicit

Risk assessors in national and international contexts hardly ever conduct scientific studies in a vacuum, and they routinely make decisions relying on value judgments on how to assess risks despite gaps in scientific knowledge. Indeed, if risk assessment is virtually an objective and neutral stage of risk analysis, its purely scientific nature may be compromised by the extensive use of methodologies and techniques which tend to predetermine its outcome. Although, at least in principle, scientists provide their scientific assessment within various scenarios and risk-managers decide on the acceptable level of risk, scientific uncertainties can make it impossible for any scientific method to lead to a factual conclusion, simply because a proper scientific study cannot be conducted. In the presence of such a scientific uncertainty, which is an inevitable component of each of the four elements of risk assessment, scientists rely on a number of assumptions and techniques to overcome this uncertainty¹¹⁶. Scientists do so because of the pragmatic goal of risk assessment: to provide risk managers with a faithful description of the scientific *status quo* in relation to a specific substance. These assumptions and techniques comprise part of a mainstream scientific method called 'science policies'¹¹⁷. These may be defined as "decision rules about the way in which risk assessment scientists should proceed when they encounter specified types of uncertainties", which should be established at a political level¹¹⁸. Thus, for example, one of the most common science policies is the presumption that a certain agent that can cause disease in laboratory animals can equally cause disease in humans. Other examples include the use of a linear dose-response model, the assumption that absorption in animals and humans is approximately the same or the use of body weight scaling for interspecies comparisons¹¹⁹. As "science policies" pervade risk analysis and are crucial to completing most risk assessments today, awareness of the exact role they play within risk assessment is imperative. Notably, it may be important to understand the origin, methods and principles upon which the underlying assumptions and

¹¹⁶ T. Christoforou, The Precautionary Principle and democratizing expertise: a European legal perspective, in *Science and Public Policy*, p. 30.

¹¹⁷ Because these policies usually specify which assumptions must be used to bridge gaps in scientific knowledge, they are also called "inference guidelines" or "default assumptions". See National Research Council (NRC), *Risk Assessment in the Federal Government: Managing the Process*, Washington, D.C.: National Academy Press, 1983, 28-37.

¹¹⁸ V.R. Walker, The Myth of Science as a "Neutral Arbiter" for triggering Precautions, 26 *Boston College International and Comparative Law Review* 197, p. 214.

¹¹⁹ For an illustration of the most common risk assessment policies used by the Codex bodies in charge of conducting most of the risk assessment leading to the adoption of the Codex standards (JECFA and JMPR), see Joint FAO/WHO Consultation Risk Management and Food Safety, (FAO Food and Nutrition Paper 65, Rome 1997), p. 7-9. On science policies see also S. Breyer, *Breaking the Vicious Circle*, Harvard University Press ed., 1993, pp. 43-44.

techniques of science policies are developed, as well as elaborating a harmonized approach to risk assessment. The need to inject some transparency into the scope of science policies is particularly important because, as seen above, their use by risk assessors is capable of determining the outcome of risk assessment. In particular, this need is strengthened by the fact that the assumptions underlying certain science policies may contain different biases. Thus, on the one hand, some authors, mainly from the US, have argued that existing risk-assessment methods and protocols are inherently biased in favour of avoiding overly stringent regulatory measures, which these authors fear may impose undue costs on innovation and technological progress and ultimately on society (progressive risk estimations)¹²⁰. On the other hand, others assert that such assumptions and policies tend to be chosen in order to arrive at the most conservative risk estimations¹²¹. An example of the latter can be found in the *Hormones* case, where the scientific experts advising the panel made repeated references to the way in which ADI (acceptable daily intake) figures were established using very sensitive end points from human primates, taking into account the vulnerability of the most sensitive members of the population when establishing safety factors¹²².

The preceding analysis clearly shows that, contrary to lawyers' expectations, science does not (because it cannot) tell us whether something is safe or not, but it merely provides us with facts about the probability of harm under certain conditions/assumptions. Yet, the WTO judicial bodies have not recognised these inherent complexities of the scientific method, preferring to endorse a more simplistic and idealised, though unrealistic, model of risk assessment. It is argued that, unless the assumptions and policies that have been employed to overcome scientific uncertainties in risk assessment are made explicit for judges, courts may struggle in reviewing the legality of a science-based measure. In fact, lacking a transparent science policy, courts will not be able to analyse a measure and determine the extent to which it is based on science, how much uncertainty there is, and whether 'other factors' have already been included within the risk assessment stage. This is crucial because, as seen above, science policies tend to predetermine the scope and nature of risk assessment, leading to an inherent conservative or progressive bias towards certain types of outcomes.

It is submitted that external expertise may help the panels in identifying the assumptions and policies that have been employed to overcome scientific uncertainties, thus making them explicit to the eyes of the experts. Thus, in *US-Continued Suspension*, Dr. Cogliano, called upon to evaluate a particular divergence of views between the US and EC regarding threshold in genotoxic potential¹²³, declared that neither view was scientifically demonstrable but rather reflected different assumptions chosen by the parties in the interpretation of the available science. Would it not have been more appropriate for the panel to try to understand more about these underlying assumptions before rejecting the EC's position and taking the side of the US?

(b) A more realistic understanding of the risk assessment requirement and of what it can offer

¹²⁰ Breyer, supra note 119; C.F. Cranor, *Regulating Toxic Substances – A Philosophy of Science and the Law*, OUP, 1997.

¹²¹ Button, supra note 73, p. 98.

¹²² Button, supra note 73, p. 98, refers to the *Hormones* Panel Report, Annex: Transcript of the joint meeting with Experts, para 65. See also, Breyer, supra note 119, p. 46; Walker, supra note 118, p. 166.

¹²³ According to the EC the fact that doses of oestradiol-17 β used in growth promotion are low is irrelevant because there is no threshold for substances which have genotoxic potential, whereas for the US it is relevant to the extent that a threshold may be determined also for these substances.

Almost 15 years of SPS disputes have clearly revealed that risk assessment is not solely a scientific venture, that it may have different definitions, and that its main components are determined by the different institutional cultures in which it operates¹²⁴. In particular, by now we know that, when scientists reach divergent scientific opinions, this can occur because they are addressing different questions and making different assumptions about risk assessment policy issues, and not just because they are providing competing answers to a shared set of questions¹²⁵. Yet, the complexities and limitations inherent in the scientific method have not been recognised by the WTO judicial bodies, which have preferred to endorse an idealised, layman's model of risk assessment. The time has come for judges to cease to look at science exclusively through the unifocal lens of legality and to acquaint their eyes with the bifocal lens of law and science, thus visualising the increased sophistication of the scientific method as well as its limitations. This is not to make judges experts of the science which is submitted to them, but to minimise foreseeable misunderstandings and misuses of the outcomes of risk assessments. There is a clear need to enable the courts to understand what that science is made of, how it has been collected and how close its answers get to the questions raised by their legal universe. Only this understanding of the scientific discipline will prevent the judges from: "[torturing] the epidemiological [and other scientific] data until they scream"¹²⁶. Indeed, "risk assessment data can be like the tortured spy. If you torture it long enough, it will tell you anything you want to know"¹²⁷.

Only a more realistic understanding of the complexities and limits of risk assessment will help in laying the foundations for a different interpretation of its substantive requirement.

C. Formal introduction of a distinction between risk assessment and risk management

The WTO has refused to endorse any particular model of risk analysis by leaving its Members free, at least in principle, to adopt the protective measures they consider the most appropriate to achieve their chosen level of protection, provided they comply with prescribed risk assessment requirements¹²⁸. In particular, the SPS provides little in the way of risk management principles to guide the resolution of disputes, providing only a definition of risk assessment¹²⁹. By emphasizing the rational, science-based stage of risk assessment, this ambiguous model of risk analysis leads the judge to focus mainly on the scientific element. Accordingly, WTO courts have begun to narrowly interpret the scientific basis for SPS measures (i.e. Article 5.1), thus limiting Member States' ability to consider non-scientific factors within their management procedures. This approach to risk analysis, by focusing solely on the rational, scientific basis of risk regulation, promotes a reading of the decision-

¹²⁴ D. Winickoff, S. Jasanoff, L. Busch, R. Grove-White, B. Wynne, *Adjudicating the GM Food Wars: Science, Risk, and Democracy in World Trade Law*, 30 *Yale Journal of International Law*, 81-123 2005.

¹²⁵ *Science in Trade Disputes Related to Potential Risks: Comparative Case Studies*, European Commission – Joint Research Center, 2004, p. 41.

¹²⁶ L. Gordis, *Epidemiologic approaches for studying human diseases in relation to hazardous waste disposal site*, 25 *Hous. L. Rev.* 837 (1988).

¹²⁷ W.D. Ruckelshaus, "Risk in a Free Society" (1984) 4 *Risk Analysis* 157 at 157.

¹²⁸ See on this point Button, *supra* note 73, pp. 66 and 231 (who argues that the AB has been careful not to link the SPS system to any particular model of risk assessment and that it refused to draw a firm distinction between risk assessment and risk management under the SPS Agreement).

¹²⁹ On this point, see T. Jostling, D. Roberts and D. Orden, *Food Regulation and Trade, Toward a Safe and Open Global System*, Institute for International Economics, Washington, D.C., 2004, p. 48 (who argue that SPS negotiators considered it inappropriate for the WTO to be more prescriptive about risk management, seeing the standard-setting organizations as the better forum for the elaboration of guidelines for regulatory action).

making process which leads to the adoption of SPS measures where there is no room, at least formally, for non-scientific factors, such as the social dimension of risk.

This is problematic because risk assessment alone does not capture the whole process of decision-making leading to the adoption of a risk regulation. Indeed, as illustrated by *EC-Hormones*, we can think of situations where the contested measure, although not scientifically supported, is not necessarily protectionist. In other words, there can be trade restrictive measures which are not protectionist, but are based on other “externalities”, such as consumer preferences. As is well known, all of these measures, not being based on science, are illegal under the WTO—notwithstanding their non-discriminatory character.

Against this backdrop, there is an urgent need to read into the SPS Agreement a more realistic risk analysis framework for dealing with non-scientific concerns and to differentiate them from the phenomenon of economic protectionism. There is a clear need to widen the WTO risk analysis framework so as to accommodate non-scientific concerns, such as social and ethical consumer preferences. Indeed, the existing scientific discipline is, in the way it has been normatively construed and judicially interpreted, producing the perverse effect of providing incentives to WTO members to hide their societies’ consumer preferences under scientific arguments in order to create (or at least artificially inflate) scientific disagreement on a given phenomenon. As was the case in most SPS disputes litigated so far, this inevitably leads to impasse.

Although the SPS Agreement primarily speaks the language of science, it should not be supposed that there is no scope in the Agreement for social and cultural factors. Unfortunately, the excessive focus on the risk assessment requirement has not permitted the DSB to explore the role and limits of other factors, particularly in situations where such factors account for regulatory differences.

To remedy to this situation, it might be important to have recourse to the notion of risk management, which has regrettably been rejected by the AB in *Hormones* because of a lack of a textual basis, and to make it explicit within the SPS legal discourse. The distinction between risk assessment and risk management, being inherent to the universal practice of risk regulation, would bring the scientific discipline closer to the realities of risk decision-making. In particular, by bridging the actual gap existing between the legal interpretation of Article 5.1 and common risk regulation practice, this distinction would rebalance the interpreter’s attention between the scientific aspect of risk regulation and the remaining components of such an analysis, which relate to the management of risk.

Encouraging signs of the recognition of the relevance of the risk assessment / risk management distinction can be found in *US-Continued Suspension*, where for the first time the AB recognised that the chosen level of protection may have some bearing on the scope and method of the risk assessment, notably when this is higher than would be achieved by a measure based on an international standard¹³⁰. Why did the AB reach this conclusion? This is because “[I]n such a situation, the fact that the WTO Member has chosen to set a higher level of protection may require it to perform certain research as part of its risk assessment that it is different from the parameters considered and the research carried out in the risk assessment carried out in the risk assessment underlying the international standards”. Therefore, although the risk assessment should not develop into “an exercise tailored to and carried out for the purpose of justifying decisions *ex post*”, but remain “in essence a rigorous and objective process”¹³¹, a risk management consideration such as the ALOP can play a role in

¹³⁰ *US-Continued Suspension*, AB Report, para 685.

¹³¹ *Ibid.*, para 1413.

determining whether the “sufficiency/insufficiency” requirement triggers the invocation of Article 5.7 SPS.

This conclusion seems to recognise the significance of embracing a risk analysis framework where both risk assessment and risk management play a role and through the interaction of which risk regulation decision-making occurs.

D. To identify a standard of review between ‘intrusiveness’ and ‘ineffectiveness’, by refocusing the object of scrutiny

The actual panels’ obsessive focus on and consequent struggle with factual analysis is an inevitable consequence of their scientifically demanding reading of the risk assessment requirement. A less rigid and scientifically demanding interpretation of the scientific discipline would immediately imply a less scientific involvement by WTO Courts and, accordingly, a different use of external experts.

While it is imperative to ensure that WTO Members abide by their scientific commitments, including the risk assessment requirement, it is argued here that this activity of judicial review can be done while at the same time according some degree of deference vis-à-vis the exercise of discretion by national authorities when making factual determinations.

Our analysis has shown that a scientifically demanding interpretation of the risk assessment requirement combined with an intrusive standard of review for SPS cases is de facto triggering a delegation of power to the experts. By acting as risk assessors on behalf of the panel, they are often expected to produce their own risk assessment for the panellists rather than to focus on an evaluation of the correctness of the scientific evidence advanced by the parties.

In our view, the risk assessment requirement could be considered to have been satisfied without necessarily involving the panels in determining whether they would characterise the risk in the same manner as the Member, but rather by ensuring that that the SPS measure is based on a reasonable understanding of the underlying scientific evidence. As a result, the object of the review should only be the risk assessment advanced by the responding party, and there shouldn’t be any need for the panel to check whether its experts would have done a risk assessment in the same way and would have reached the same conclusion. In other words, it is time that the panel return the responsibility of conducting risk assessments to the Member States.

Calls for a more developed standard of review in SPS cases seem to have finally been answered by the recent AB report in *US – Continued Suspension*. In reversing the panel’s finding that the EC had not satisfied the requirements of Article 5.1 SPS on the grounds of standard of review, the AB has not only struck down the previous consolidated approach, but has also laid down, for the first time, a new standard of review applicable to SPS measures. According to the AB, the principle guiding the review of SPS measures should be the following:

“The question is to determine not whether the risk assessment undertaken is correct and the alleged risk exists, but rather to determine *whether that risk assessment is supported by coherent reasoning and respectable scientific advice* and is, in this sense, objectively justifiable.”

As a result, “the panel’s task is not to conduct a risk assessment but to review the risk assessment advanced by the responding party”.

In particular, the AB set four different chronological steps that the panels should follow:

- to identify the scientific basis upon which the SPS measure was adopted ;
- to verify whether that scientific basis comes from a “respected and qualified source”;
- to assess whether “the reasoning articulated [by the WTO Member] on the basis of the scientific evidence is objective and coherent”
- to determine whether the conclusions of the risk assessment “sufficiently warrant the SPS measure”¹³².

The premises for the introduction of a standard capable of instructing panels on how to conduct their review of SPS measures seem to have been laid down. Unlike the “objective assessment” standard of review, the standard elaborated by the AB provides some guidance on how intense the scrutiny should be, notably as regards to scientific issues. However, by expressly introducing a “minimum scientific threshold” for the evidence advanced by the parties¹³³, this standard requires the panels to appoint external experts and to rely heavily on their opinions regarding the origin and quality of the scientific evidence under examination. The panels are even encouraged to act in this manner by the AB. This codifies the creation of *de facto* hybrid panels for all SPS cases in the future. As a result, the way in which the experts are selected and the manner in which their inputs are taken into account has become of even greater importance than before.

E. Better use of external expertise

The ordinary machinery of the judiciary, even the international judiciary, has little capacity to check compliance with the risk assessment requirement. Research findings are never directly suitable for decision-making. The results of different studies of the same phenomena often conflict, uncertainties can be large, and the conditions under which health threats can be studied usually do not match the conditions of interest for the protection of public health. Research findings need to be interpreted. As a result, regardless of the level of scrutiny exercised upon the scientific evidence advanced by the parties to a dispute, there is clear need for the WTO judges, who cannot be epistemically capable of using these sources, to rely on the advice of experts. However, although external expertise is intended to assist the panels in understanding the highly complex evidence brought before them, the current practice of utilising expert advice is largely problematic.

(a) To redefine the role of expertise and the panels-experts relationship

The expert consultation is justified by the assumption that panel Members, by consulting scientists who specialize in areas related to the dispute, may be better suited to understand and critically assess the scientific evidence advanced by the parties. In fact, as stated by the panel in the *Salmon* case,

“Expert opinions are opinions on the evidence submitted by the parties”¹³⁴.

¹³² US-Continued Suspension, AB Report, para 591.

¹³³ On this notion, see A. Alemanno, *Trade in Food – Regulatory and Judicial Approaches in the EC and the WTO*, London: Cameron May, 2007, p. 368-371.

¹³⁴ See also panel report on *Australia - Salmon*, paras 8.41, 8.126 and 8.172. In full conformity to this approach, in the *Agricultural Products* case, Dr. Ducon simply stated: “[t]he arguments put forward by Japan for requiring

Accordingly,

"a panel is entitled to seek information and advice from experts and from any other relevant source it chooses [...] to help it to understand and evaluate the evidence submitted and the arguments made by the parties, but not to make the case for a complaining party"¹³⁵.

However, panels have shown some confusion regarding the appropriate role for scientific expertise¹³⁶. Although it might seem that expert advice should not cover more than the evidence submitted by the parties, panels tend to directly ask experts the same scientific question that the panel itself has to answer¹³⁷. In so doing, panels entrust the experts with a more cumbersome task: to present a state of the art risk assessment of the issue at stake¹³⁸. This use of scientific experts has recently been found to be in breach of the "objective assessment" standard of review by the AB in *US-Continued Suspension*¹³⁹. In designing a new standard of review applicable to SPS measures, which focuses not on the existence of the alleged risk but on the reasonableness of the *scientific advice* given to the panel, has also implicitly reoriented the role of external expertise. Experts will be called upon to help the panels in engaging in the four steps listed by the AB (identifying the scientific basis underlying the SPS measure; determining its quality; determining the objective and consistent character of the conclusions developed upon that science; determining whether there is a rational relationship between these conclusions and the adopted measure). This better framing of the role of expertise must be applauded, but one must be aware that this will only become a reality if there is an unconditional acceptance of the standard of review suggested above.

(b) Expert Review Groups as opposed to Individual Experts

Each time a party expressly asked for the appointment of an expert review group (typically the EC), the panel appointed individual experts instead¹⁴⁰. The Appellate Body has endorsed

varietals trials are not based on scientific data. They are supported by a few experimental data in which varietals difference exists, in terms of LD50, among a lot of other data in which it does not". See Panel Report, Agricultural Products, para 8.36.

¹³⁵ Japan-Agricultural Products, AB Report, para 129.

¹³⁶ See J.O. Mc Ginnis and M.L. Movsesian, *The World Trade Constitution*, 114 *Harvard Law Review* 511, p. 594 (2000) and T.P. Stewart and A.A. Karpel, *Review of the Dispute Settlement Understanding: Operation of Panels*, in 31 *Law & Pol'y Intl Bus* 593 (2000).

¹³⁷ This clearly happened in the Agricultural products case, where the experts advising the panel were asked whether "in their expert opinion, there is an objective or rational relationship between, on the one hand, the varietal testing requirement imposed by Japan and, on the other hand, any evidence submitted by the parties". Japan-Agricultural Products, Panel Report, para 8.35.

¹³⁸ This trend towards a 'delegation' of responsibility in deciding the outcome of a dispute has caused uneasiness with an expert appointed in the Hormones dispute. On the occasion of the joint meeting with experts, Dr Ritter vocally denounced the fact that the provision of an answer to the question of whether residual hormones in beef would produce a biological effect on consumers would "really pre-empt the outcome of the dispute". See EC-Hormones, Panel Report, Annex: Joint Meeting with Experts, para 64.

¹³⁹ US-Continued Suspension, AB Report, para 590.

¹⁴⁰ This has happened notwithstanding the expressed request of the complaining party to appoint an expert review group in the Shrimps-Turtles case and notwithstanding the complainant and defendant common request in the Hormones case. See for a criticism of this position, T. Christoforou, *Settlement of Science-Based Trade Disputes in the WTO: A Critical Review of the Developing Case Law in the Face of Scientific Uncertainty*, supra note 216, at 622, 630-1 and Christoforou, *Law and Precaution in Dispute Resolution on Health and Environmental Protection: What Role for Scientific Experts?*, J. Bourrinet et S. Maljean-Dubois (eds.), *Le Commerce International des Organismes Génétiquement Modifiés*, LGDJ : Éd. Panthéon-Assas, 2003, p. 255.

this preference by interpreting Article 13 DSU as referring to expert review groups as a mere option (that a panel *may* request)¹⁴¹. As argued elsewhere, this constant practice raises several procedural and substantive questions which deserve closer scrutiny.

Although rendered controversial by the wording of the WTO texts, this preference for the appointment of individual experts tends to be justified on practical grounds¹⁴². The main argument presented in favour of such an option is that expert individual consultation is not only less time-consuming than group review (eliminating the necessity of generating a common written report as provided for in Appendix 6.4 DSU), but it also ensures more flexibility in the consultation process. In an expert individual consultation – the argument goes – a panel, by asking specific questions of each expert and by adding questions during the process, would obtain the individual opinion of each expert rather than a common and monolithic consensus position. This would help the panel in assessing the scientific evidence brought by the parties. However, contrary to conventional wisdom, the provision of expertise by individual experts within the judicial review context is not necessarily more efficient than the setting up of an expert review group.

While reliance on individual experts may appear to render the expertise consultation process more expeditious and flexible than the expert advisory group scheme, past cases have clearly shown how these expectations cannot realistically be met. In fact, the provision of various opinions by individual experts inevitably produces the effect of providing the judge with further scientific material to consider and evaluate. This has been expressly recognized by the panel in *Japan – Agricultural Products*, which stated:

"We are called to examine and to weigh all the evidence [...] including the opinions we received from the experts advising the panel"¹⁴³.

In particular, opinions elaborated on an individual basis and according to different methodologies lead the panel to engage in a complex quasi-scientific analysis aimed at verifying whether there is common ground among these opinions. This evaluation becomes even more complex when individual experts hold divergent views.

While the main objective of the expert consultation procedure should be to prevent the panellists from getting involved in scientific issues by providing them with an assessment of the plausibility of the scientific evidence advanced by the parties to the dispute, the individual consultation practice described is likely to achieve the exact opposite result. Indeed, by introducing into the review process additional (and often conflicting) scientific materials to be assessed together with the competing scientific claims brought by the parties, reliance on individual experts paradoxically renders the task of the judges even more (scientifically) cumbersome. How can judges be expected to be epistemically capable of assessing the possibly conflicting individual scientific opinions expressed by the experts?

In the light of the above, it is suggested that the appointment of an expert review group, though apparently more time-consuming, may potentially simplify the scientific task that judges are increasingly called upon to accomplish. Being entrusted with the duty of coming up with a written report, the expert group would be forced to either find common ground on the different specific scientific issues at stake or, at least, to genuinely represent the whole spectrum of scientific opinions (i.e. majority and minority) existing in the current scientific

¹⁴¹ This has recently been confirmed in *US-Continued Suspension*, AB Report, para 7.72-7.75.

¹⁴² For a complete description of the practical arguments generally invoked to justify the panels' preference for individual expert consultation, see J. Pauwelyn, *The use of experts in WTO Dispute Settlement*, *International and Comparative Law Quarterly* 51, 325 (2002), p. 328.

¹⁴³ Panel Report in *Japan – Agricultural Products*, para 7.408.

state-of-the-art research on that controversial issue. In fact, adherents to different schools of thought should be represented among the experts. By borrowing the AB's language, the expert review group may set out, according to this model,

"both the prevailing view representing the mainstream opinion, as well as the opinions of scientists taking a divergent view"¹⁴⁴.

(c) Due process should apply to a panel's consultation with experts

As suggested by the AB in *US-Continued Suspension*, to the extent that scientific experts' opinions "have a significant bearing on a panel's consideration of the evidence and its review of a domestic measure, especially in cases [...] involving highly complex scientific issues, the protection of due process applies to a panel's consultation with experts"¹⁴⁵. In particular, the process leading to their appointment and the modalities of their consultation should be subject to a more rigorous discipline and, accordingly, adequate scrutiny.

Conclusions on Expertise

Despite the abovementioned limits of the current expert consultation practice, the increasing use of expert advice within the WTO is a positive development that must be applauded¹⁴⁶. Expert advice not only ensures quality, transparency and legitimacy in WTO decisions but also, if adequately fine-tuned, might potentially reduce the level of scientific involvement currently required by the standard of legal review of science-based measures. In particular, to make the expert consultation a useful tool for decreasing the panels' involvement with scientific matters, it is necessary to favour reliance on expert advisory groups (instead of individual experts) and to determine the exact scope of the consultation expertise.

9. Conclusions

The original choice of the SPS drafters to identify science as a *deus ex machina* principle capable of relieving the policy-maker and the judge of the task of making choices about the safety of a product, although naïve in its conception, is not entirely surprising. Indeed, science has always appealed to and fascinated members of the legal world. Science, by offering the prospect of neutrality and objectivity, seems capable of rescuing policy-makers from the uncomfortable experience of uncertainty in complex legal decisions.

This choice reflects the constant trend in law of turning to science to solve its problems. However, as confirmed by our analysis, this strategy of delegation to science frequently fails, leading to chaos, confusion and frustration in legal proceedings¹⁴⁷. In turn, this failure, inevitably being the result of a legal construction, perpetuates the idea that the law is often too

¹⁴⁴ Hormones, AB Report, para 194.

¹⁴⁵ US-Continued Suspension, AB Report, para 436.

¹⁴⁶ Similarly, also the International Court of Justice's experience with the use of experts may be seen as a positive development (Article 50 of the Statute of the Court states that: "The Court may, at any time, entrust any individual, body, bureau, commission, or other organization that it may select, with the task of carrying out an enquiry or giving an expert opinion." Article 51 of the Statute continues by stating that: "During the hearing any relevant questions are to be put to the witnesses and experts under the conditions laid down by the Court in the Rules of Procedure referred to in article 30."). See, notably, for an excellent survey of expert evidence in the first fifty years of the International Court of Justice, G. White, *The Use of Experts by the International Court*, in V. Lowe and M. Fitzmaurice eds., *Fifty years of the International Court of Justice, Essays in Honour of Sir Robert Jennings*, Cambridge University Press, 2005.

¹⁴⁷ R. Feldman, *Law's Misguided Love Affair with Science*, *Minn. J.L. Sci. & Tech.*, 2009, 10(1):95-116, at 115.

weak and inadequate to solve the world's problems, thus, paradoxically, reinforcing our eternal hope that law needs science to resolve difficult issues.

Yet, as illustrated above, science has still a lot to offer to the multilateral trade regime and is certainly an indispensable criterion for distinguishing between right and wrong risk-based justifications under the WTO/SPS. However, to fully exploit scientific inputs, Law should not blindly defer to Science, but rather regain control of its adjudicatory function and start crafting its legal rules by relying on these insights. Our list of recommendations might not solve all intricacies existing behind the SPS scientific discipline, but it could assist Law in reorienting the use of Science within the multilateral trade system. We need to build faith in cooperative dialogue between members of these two professions so as to build trust and a common language . *Au travail!*