Sword or Shield?
The Impact of WTO Law on the Extraterritorial Effect of Sanitary and Phytosanitary Measures

Dominique Sinopoli

1. Developing science-based food safety regulations is challenging when the concept of 'science' is disputed.
   (this thesis)

2. Domestic regulatory standards are more barriers than catalysts.
   (this thesis)

3. Mandatory labelling of GM foods increases the stigma that they are unsafe.

4. The fact that everyone thinks they are a food safety expert leads to more food poisoning and unjustified shaming.

5. The United States is a failed democracy.

6. If Wageningen University prides itself on being sustainable it should not dispense disposable plastic cups at coffee machines.

Propositions belonging to the thesis, entitled

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Abbreviations

AB	Appellate Body
AFSSA	Agence Française de Sécurité Sanitaire des Aliments (food safety agency of France)
AI	Avian influenza
ALCM	Apple leaf curling midge
ALOP	Appropriate Level of Protection
ASF	African swine fever
BSE	Bovine spongiform encephalopathy
CBS	Citrus black spot
CFR	Code of Federal Regulations (of the United States)
CGA	Citrus Growers' Association (of South Africa)
Codex	Codex Alimentarius Commission
COOL	Certain Country of Origin Labelling
CP	Compliance Panel
DAFF	Department of Agriculture, Forest and Fisheries (of South Africa)
DBES	Date-based export scheme
DSB	Dispute settlement body
DSU	Dispute settlement understanding
EC	European Communities
ECJ	European Court of Justice
EFSA	European Food Safety Authority
ePhyto	Electronic phytosanitary certificate
ETP	Eastern Tropical Pacific
EU	European Union
FAO	Food and Agriculture Organization

FMD	Foot and mouth disease
FTA	Free trade area
GATT	General Agreement on Tariffs and Trade
GeNS	Generic national system
GM	Genetically modified
GMO	Genetically modified organism
HPNAI	Highly pathogenic notifiable avian influenza
IP	Intellectual property
IPPC	International Plant Protection Convention
IPR	Intellectual property rights
ISF	International Seed Federation
ISHI-Veg	International Seed Health Initiative for Vegetable Crops
ISO	International Organization for Standardization
ISPM	International standards for phytosanitary measures
ISTA	International Seed Testing Agency
LPNAI	Low pathogenic notifiable avian influenza
MMPA	Marine Mammal Protection Act (of the United States)
NAI	Notifiable avian influenza
NFU	National Farmers' Union (of England and Wales)
NGO	Non-governmental organization
NHTC	Non-Hormone Treated Cattle
NOAA	National Oceanic and Atmospheric Administration (of the United States)
NPPO	National plant protection organization
NTB	Non-tariff barrier to trade
OECD	Organisation for Economic Co-operation and Development
OIE	International Office of Epizootics
P	Panel

P4P	Plants for planting
PRA	Pest risk analysis
QDS	Quality declared seed
REACH	Registration, Evaluation, and Authorization of Chemicals
SPS	Sanitary and phytosanitary
TBT	Technical Barrier to Trade
TDCA	Trade, Development and Cooperation Agreement
TFEU	Treaty on the Functioning of the European Union
UK	United Kingdom
UN	United Nations
UPOV	International Union for the Protection of New Varieties of Plants
US	United States
USD	United States dollar
USDA	United States Department of Agriculture
WIPO	World Intellectual Property Organization
WTO	World Trade Organization
ZAR	South African rand

CHAPTER 1

General introduction

1.1 Introduction

Domestic regulatory standards may unfold effects beyond a given country's jurisdiction. Legal scholars increasingly study this mechanism as the extraterritorial effect of domestic regulatory standards on trading partners. It has most frequently been observed with the exportation of European Union (EU) rules to other countries, in particular across the Atlantic to the United States (US). Most of this scholarship has focused on the adoption of the typically more stringent EU laws as an inevitable consequence of accessing the EU market, resulting in a 'trading up' of regulatory standards.[1] More recently scholars have also examined this phenomenon from the US perspective, looking into the routes EU law uses to travel into the US[2]; and studied methodologically exactly what, how and why is being transferred.[3]

This 'extraterritorial effect' does not happen in a void of law, but is subject to the rules of international trade. The World Trade Organization (WTO) is the most important body governing international trade and hence has great potential to affect the extraterritorial effect phenomenon. The WTO dispute settlement system serves as a venue for challenging other countries' trade rules. If the Dispute Settlement Body (DSB) declares a measure as incompliant with WTO law, the country imposing it is expected to comply with the ruling.[4] However, scholars have argued that, more often than not, WTO rules 'provide little protection'[5] against the extraterritorial effect of measures. One of the main reasons it has arguably failed to constrain extraterritoriality is through the non-discrimination principle.[6] In situations in which foreign companies are subject to the same rules as EU companies, it has been argued that '(i)f the EU regulations have no disparate impact on foreign producers, allegations of protectionism are difficult to

[1] See for example Gregory Shaffer (1999), The Power of EU Collective Action: The Impact of EU Data Privacy Regulation on US Business Practice. *European Law Journal* 5(4): 419-437; Gregory Shaffer (2000), Globalization and Social Protection: The Impact of EU and International Rules in the Ratcheting Up of U.S. Privacy Standards. *Yale Journal of International Law* 25(1): 1-88; David A. Wirth (2007), The EU's New Impact on U.S. Environmental Regulation. *Fletcher Forum of World Affairs* 31(2): 91-109; Anu Bradford (2012), The Brussels Effect. *Northwestern University Law Review* 107(1): 1-68.

[2] Joanne Scott (2009), From Brussels with Love: The Transatlantic Travels of European Law and the Chemistry of Regulatory Attraction. *American Journal of Comparative Law* 57(4): 897-942.

[3] Elaine Fahey (2017), *The Global Reach of EU Law*. Routledge.

[4] Bradford, above n. 1.

[5] Gregory Shaffer (2000), Globalization and Social Protection: The Impact of EU and International Rules in the Ratcheting Up of U.S. Privacy Standards. *Yale Journal of International Law* 25(1): 1-88, p. 46.

[6] Bradford, above n. 1, p. 56; Gregory Shaffer (1999), The Power of EU Collective Action: The Impact of EU Data Privacy Regulation on US Business Practice. *European Law Journal* 5(4): 419-437, p. 426.

maintain. The WTO can do little to restrain such regulations that are costly yet not protectionist in their object or effect.'[7] Similarly, since the EU has a 'legitimate public policy objective'[8] as a basis for its measures, the WTO can only provide a 'limited check'[9] on the extraterritorial reach of the EU's measures'. Additionally, scholars have observed that WTO rules may even serve as a 'shield' against retaliation.[10] If a responding country does not comply with the dispute settlement ruling, retaliation is often not an effective solution (particularly for smaller trading partners) and responding to extraterritorial measures with unilateral trade sanctions may be in violation of WTO law. The WTO does not only not limit the extraterritorial effect of measures, but it 'may even help to facilitate it'[11] and 'contribute to a trading up'[12] of laws.

This dissertation argues that existing scholarship offers a limited perspective on the use of WTO rules as a 'sword' or shield' to constrain or facilitate the extraterritorial effect of measures. The conceptualizations described above are often based on simplified notions of WTO rules without addressing their complexities. This is perhaps due to the fact that the previous research has been mostly conducted from the perspective of the EU[13], with WTO law approached in a more abstract way. For example, the claims regarding non-discrimination look only at the surface of the issue and do not consider that measures may violate WTO rules for reasons other than discrimination. This limited approach to WTO law may result in a misrepresentation of how domestic measures may be regulated.

This dissertation looks into the extraterritorial effect of domestic regulatory measures from a WTO law perspective and pays particular attention to the technicalities of WTO rules. Such a detailed approach allows for an extensive examination of the application of WTO rules as a 'sword' or 'shield', looking beyond dispute settlement, retaliation and non-discrimination in general, and focusing on specific provisions and applications of

[7] Bradford, above n. 1, p. 55-56.

[8] Shaffer, above n. 5, p. 54.

[9] Ibid., p. 54.

[10] Shaffer, above n. 6, p. 419; Gregory Shaffer (2010), Risk Science, and Law in the WTO: The Centrality of Institutional Choice. *Proceedings of the 104th Annual Meeting of the American Society of International Law.*

[11] Bradford, above n. 1.

[12] Shaffer, above n. 5, p. 55.

[13] Dominique Sinopoli & Kai Purnhagen (2016), Reversed Harmonization or Horizontalization of EU Standards?: Does WTO Law Facilitate or Constrain the Brussels Effect? *Wisconsin Journal of International Law* 34(1): 92-119, p. 95.

WTO law. The focus is not only on the technicalities, but also specifically on the understudied area of sanitary and phytosanitary (SPS) measures.

An elaboration of the 'extraterritorial effect' phenomenon is presented in Section 1.2, including an overview of the various terms used and a discussion of why such measures may be enacted. This is followed by background information on the SPS Agreement in Section 1.3. Sections 1.4-1.6 cover the research questions, methodology and an overview of the entire dissertation.

1.2 Extraterritorial effect of measures

The extraterritorial effect of measures is not a new concept; it has been discussed in the literature for decades. Paradoxically, trade liberalization has been argued both to trigger a 'race to the bottom'[14] or a 'race to the top' [15] of standards. Whether it is one or the other depends largely on the specific case study and often simply the opinion of the scholar. While the downward or upward effect of trade liberalization may be open for discussion, both sides agree that there is a flow of standards across borders. As observed by Vogel (1995): 'Trade and agreements […]affect not only the flow of goods among nations, but also the movement of regulations across national boundaries. Nations are thus increasingly importing and exporting standards as well as goods.'[16] He found that in the case of environmental product standards there was a ratcheting upward of regulations.[17] He termed this phenomenon the 'California Effect', and linked it to a 'trading up' effect, specifically in the case of stricter standards providing a competitive advantage.[18]

Since Vogel introduced the notions of 'trading up' and the 'California Effect', the power to regulate global markets has been referred to by various terms, such as 'extra-

[14] William L. Cary (1974), Federalism and Corporate Law: Reflections Upon Delaware. *Yale Law Journal* 83(4): 663-705; Alan Tonelson (2002), *The Race to the Bottom: Why a Worldwide Worker Surplus and Uncontrolled Free Trade are Sinking American Living Standards*. Basic Books; Bruce Silverglade (2000), The WTO Agreement on Sanitary and Phytosanitary Measures: Weakening Food Safety Regulations to Facilitate Trade? *Food and Drug Law Journal* 55: 517-524.

[15] David Vogel (1995), *Trading Up: Consumer and Environmental Regulation in a Global Economy*. Harvard University Press; David Vogel & Robert A. Kagan (2004), *Dynamics of Regulatory Change: How Globalization Affects National Regulatory Policies*. University of California Press, p. 3; Bradford, above n. 4.

[16] Vogel, above n. 15, p. 2.

[17] Ibid., p. 259-269.

[18] Ibid., p. 6.

jurisdictional impact'[19], 'back impact'[20], 'upward harmonization'[21], 'law's migration'[22], 'regulatory turbulence'[23], 'unilateral regulatory globalization'[24], the 'Brussels Effect'[25], 'territorial extension'[26] and 'rule-transfer'[27]. Many of these terms are related, and in some cases build upon each other. Shaffer (1999) and Wirth (2007) described 'extra-jurisdictional impact' and 'back impact', respectively, more generally as the impact of EU regulatory policy on other countries, demonstrated with the example of the US. Wirth also described what he referred to as 'upward harmonization', which is when 'higher standards buoy up those of others, creating…momentum in the direction of greater rigor' (essentially Vogel's concept of 'trading up'). He added 'This kind of upward harmonization can occur when a jurisdiction with high standards and that commands a very large market makes a unilateral regulatory decision, even one that ostensibly applies only internally. If that jurisdiction's market share is sufficiently large, regulatory requirements can affect an even larger area, including those under the control of other sovereign authorities.'[28] Scott (2009) described 'law's migration' as the impact that foreign law can have in other countries, by 'serving as both a catalyst and a resource for regulatory reform'. Scott found that the flow of laws was not entirely one way, however, and that reciprocal learning could occur.[29] Sachs (2009) described 'regulatory turbulence' as 'an unintended byproduct of one jurisdiction's regulatory decisions', which 'can trigger unexpected economic, political, and cultural ripple effects in numerous jurisdictions—effects that may or may not be reflected, ultimately, in national legislation.'[30]

Bradford's (2012) description of 'unilateral regulatory globalization' builds upon these concepts, which she defined as when 'a single state is able to externalize its laws and regulations outside its borders through market mechanisms, resulting in the

[19] Shaffer, above n. 6.
[20] Wirth, above n. 1.
[21] Ibid.
[22] Scott, above n. 2.
[23] Sachs, above n. 30.
[24] Bradford, above n. 1.
[25] Ibid.
[26] Joanne Scott (2014), Extraterritoriality and Territorial Extension in EU Law. *American Journal of Comparative Law* 62(1): 87–126.
[27] Fahey, above n. 3.
[28] Wirth, above n. 1, p. 96.
[29] Scott, above n. 2.
[30] Noah M. Sachs (2009). Jumping the Pond: Transnational Law and the Future of Chemical Regulation. *Vanderbilt Law Review* 62: 1817-1869, p. 1844-1845.

globalization of standards…Unilateral regulatory globalization is a development where a law of one jurisdiction migrates into another in the absence of the former actively imposing it or the latter willingly adopting it.'[31] A specific application of unilateral regulatory globalization is described colloquially as the 'Brussels Effect': 'Europe's unilateral power to regulate global markets'.[32] Bradford described how EU regulations impact standards around the world through the process of unilateral regulatory globalization.[33] Market forces are strong enough to create involuntary incentives for businesses to adjust to stricter standards. Even though exporting businesses would prefer other standards, they reluctantly adopt the strict standards of importing countries due to the opportunity costs of not doing so.[34] Foreign companies must typically meet importing country requirements in order to gain market access. It is often more cost effective for them to adopt one standard instead of frequently adjusting production to meet various standards, and they therefore apply the importing country standard to all its products, whether they are exported to this one country or elsewhere in the world.[35] Similarly to the Brussels Effect, 'territorial extension' is described by Scott (2004) as the practice of enabling the EU 'to govern activities that are not centered upon the territory of the EU and to shape the focus and content of third country and international law.'[36] It is used 'to shape the organization, operation and governance of firms, including foreign firms wishing to provide services within the EU'.[37] Fahey (2017) described 'rule-transfer' as 'a means or process by which EU legal rules are adopted in third country legal orders'[38] and showed how EU rules move and are adopted abroad.[39]

[31] Bradford, above n. 1, p. 4.

[32] Ibid., p. 3.

[33] Ibid., p. 3.

[34] Ibid., p. 9.

[35] Ibid., p. 6.

[36] Scott, above n. 26, p. 89.

[37] Ibid., p. 107.

[38] Fahey, above n. 3.

[39] The term 'extraterritorial effect' was selected in this dissertation as an umbrella term to capture the terms described above, i.e. generally when a stringent measure of an economically strong country migrates to another country on the back of traded goods. In Chapter 3, the term 'unilateral regulatory globalization' was used, but the meaning is the same and it is interchangeable with 'extraterritorial effect'. In Chapter 4, the term 'Brussels Effect' was used because the criteria applied were directly from Anu Bradford's piece titled 'The Brussels Effect' (2012).

It is worth noting that Joanne Scott makes a distinction between territorial extension and enacting extraterritorial legislation. She wrote: 'a measure will be regarded as extraterritorial when it imposes obligations on persons who do not enjoy a relevant territorial connection with the regulating state. By contrast, a measure will be regarded as giving rise to territorial extension when its application depends upon the existence of a relevant territorial connection, but where the relevant regulatory determination will be shaped as

Bradford and Scott observed that the exportation of EU standards was mainly unintentional. Bradford found that 'The EU's external regulatory agenda has thus emerged largely as an inadvertent by-product of that internal goal [of creating an internal market] rather than as a result of some conscious effort to engage in "regulatory imperialism."'[40] Scott also wrote that 'it is inaccurate to say that the EU thereby seeks to export its own norms. EU legislation which engages in territorial extension is generally characterized by an international orientation revealing the EU to be engaged in action-forcing contingent unilateralism rather than the exportation of norms.'[41] Countries enact stringent measures to protect their own consumers—and perhaps even their own producers and economics through protectionist measures—but the migration of these regulations to other countries is regarded as essentially a side effect of the stringent standards. It is questionable, however, whether intent matters. Even if the EU and other dominant countries do not intend to export their rules, they may in fact have exactly this effect.[42]

1.3 Food and agriculture sectors under WTO law: The SPS Agreement

The extraterritorial effect of measures has been demonstrated in the context of a variety of areas: laws of climate change[43]; data privacy[44]; chemicals, specifically on Registration, Evaluation, and Authorization of Chemicals (REACH)[45]; GMOs[46]; antitrust[47];

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a matter of law, by conduct or circumstances abroad.' Her use of the term 'territorial extension' is more consistent with 'extraterritorial effect' used in this dissertation, even though what she considers to be 'extraterritorial legislation' is something different. Scott argues that the EU rarely enacts extraterritorial legislation but frequently employs territorial extension 'to influence conduct that takes place outside the EU.' Joanne Scott (2014), The New EU 'Extraterritoriality'. *Common Market Law Review* 51(5): 1343-1380, p. 1343-1344.

[40] Bradford, above n. 1.

[41] Scott, above n. 26, p. 87.

[42] Ibid., p. 107-108.

[43] Joanne Scott & Lavanya Rajamani (2012), EU Climate Change Unilateralism. *European Journal of International Law* 23(2): 469-494, p. 470; Scott, above n. 26.

[44] Shaffer, above n. 5, p. 46; Shaffer, above n. 6, p. 419; Bradford, above n. 1.

[45] Diana Bowman & Geert van Calster (2007), Reflecting on REACH: Global Implications of the European Union's Chemicals Regulation. *Nanotechnology Law & Business* 4(3): 375-384; Scott, above n. 2.; Wirth, above n. 1; Sachs, above n. 30; Bradford, above n. 1.

[46] Alasdair R. Young (2003), Political Transfer and 'Trading Up'? Transatlantic Trade in Genetically Modified Food and U.S. Politics. *World Politics* 55(4): 457-484; Bradford, above n. 4; Mark A. Pollack & Gregory C. Shaffer

environment[48]; maritime transport[49]; air transport[50] and financial services[51]. Besides the research in the area of GMO regulation, however, there has been no other work done on the extraterritorial effect in the food and agricultural sectors.

With the emergence of the World Trade Organization (WTO) and the resulting reduction in tariffs, non-tariff barriers (NTBs) to trade have become even more prevalent. SPS standards in particular are presently considered to be the biggest impediment to trade.[52] Since the establishment of the World Trade Organization (WTO), over 500[53] disputes have been formally raised, of which 47 have cited the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) in their request for consultations. [54]

The SPS Agreement[55] entered into force on 1 January 1995, the same date that the WTO was established. It 'applies to all sanitary and phytosanitary measures which may, directly or indirectly, affect international trade' (Article 1.1). Sanitary and phytosanitary measures (SPS measures) are defined as those that intend to protect human, animal or plant life or health (Annex A). SPS measures can take the form of e.g. maximum allowable levels of pesticide residues, product inspections, requirement to use only certain additives in food, requirement for products to come from disease-free areas, import bans, quarantine requirements and labeling requirements.

The SPS Agreement states that Members have the right to take SPS measures (Article 2.1), but only under certain conditions: they must be 'applied only to the extent necessary to protect human, animal or plant life or health…based on scientific

(2009), *When Cooperation Fails – The International Law and Politics of Genetically Modified Foods*. Oxford University Press.

[47] Florian Wagner-von Papp (2012), *Competition Law, Extraterritoriality and Bilateral Agreements*. In Ariel Ezrachi (Ed.), *Research Handbook on International Competition Law*. Edward Elgar Publishing; Bradford, above n. 1.

[48] Ibid.; Scott, above n. 26.

[49] Scott, above n. 26.

[50] Ibid.

[51] Ibid.

[52] European Commission (2013), *European Union and United States to Launch Negotiations for a Transatlantic Trade and Investment Partnership*, http://trade.ec.europa.eu/doclib/press/index.cfm?id=869.

[53] WTO, *Chronological List of Disputes*. Accessed 21 February 2018, https://www.wto.org/english/tratop_e/dispu_e/dispu_status_e.htm

[54] Ibid.

[55] WTO, Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement).

principles…and not maintained without sufficient scientific evidence' (Article 2.2). Countries are encouraged to base their measures on international standards, guidelines and recommendations, where they exist, in order to achieve harmonization (Article 3.1). The SPS Agreement specifically endorses the standards of the Codex Alimentarius Commission for food safety, of the International Office of Epizootics (OIE) for animal health and zoonoses, and of the International Plant Protection Convention (IPPC) for plant health (Annex A(3)). Members are permitted to deviate from international standards and introduce SPS measures that are stricter than those of the international organization if they can provide scientific evidence demonstrating that they are necessary for the protection of human, animal or plant life or health (Article 3.3). If SPS measures are based on the standards, guidelines or recommendations established by one of the three endorsed organizations, then they are presumed to be consistent with WTO law[56] and have 'greater immunity.'[57] Other key provisions include that SPS measures must be based on a risk assessment (Article 5.1) and must not be more trade-restrictive than required to achieve the appropriate level of protection (ALOP) (Article 5.6).

Governments enact SPS measures to ensure both domestically produced and imported food products are of a sufficiently high standard – not only for the protection of human life and health, but also for that of animals and plants. They primarily aim to minimize the chance that humans consume foods containing harmful pathogens, contaminants or ingredients that can cause illness or death; and that pathogens in food products transfer to and subsequently infect other animals or plants. Such public regulatory standards address important health and safety concerns. From a free trade perspective, however, they also constitute trade barriers.[58] This is largely due to the fact that what different countries consider to be of a 'sufficiently high standard' varies around the world due to differences in dietary preferences, perceptions of risk, climate, technology, infrastructure and incidence of pests and diseases.[59]

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[56] SPS Agreement, Annex A 3(a).

[57] Jeffery Atik (1997), Science and International Regulatory Convergence. *Northwestern Journal of International Law and Business* 17(1): 736-758; p. 744.

[58] Spencer Henson & Rupert Loader (2001), Barriers to Agricultural Exports from Developing Countries: The Role of Sanitary and Phytosanitary Requirements. *World Development* 29(1): 85-102, p 85; Steven Jaffee & Spencer Henson (2004), Standards and Agro-Food Exports from Developing Countries: Rebalancing the Debate. *World Bank Policy Research Working Paper 3348*, p. 1.

[59] Jaffee & Henson, above 58, p. 1-2.; Emily Reid (2012), Risk Assessment, Science and Deliberation: Managing Regulatory Diversity Under the SPS Agreement? *European Journal of Risk Regulation* 3(4): 535-544; Michael Ming Du (2010), Autonomy in Setting Appropriate Level of Protection Under the WTO Law: Rhetoric or Reality? *Journal of International Economic Law* 13(4): 1077–1102; Dasep Wahidin & Kai P. Purnhagen (2017),

Although often times SPS measures are necessary for legitimate health concerns, they may be hidden protectionist measures. Protectionist measures are those that protect domestic industries from foreign competition; types of protectionist measures may include tariffs, import quotas and NTBs. *This research looks beyond the traditional definition of protectionist measures to include also those domestic standards that dominate other markets through an extraterritorial effect.* SPS measures are sometimes used in a protectionist way with regards to their domestic standards, which may then influence standard-setting in less strong countries.

Ultimately, the SPS Agreement searches for 'the right balance'[60] between Members' rights to take domestic measures for the protection of human, animal or plant life or health and the free trade paradigm that characterizes the WTO. It aims to allow governments to provide the level of protection they deem appropriate, while at the same time ensure that SPS measures are based on science and are not misused for protectionist purposes, by providing 'scientific' justifications for import bans or unnecessarily strict measures.[61] It can be particularly challenging, however, to distinguish between measures that have a legitimate justification and those that do not.[62] This is largely due to the fact that 'in most circumstances where protectionism is alleged, there are at least partially legitimate food safety or agricultural health issues involved. In other cases, trading partners have differing perspectives on the current state of scientific knowledge and/or the need to make allowance for uncertainty.'[63] It is for this reason that the SPS Agreement promotes the use of science and risk assessment,[64] since they can provide impartial standards by which to evaluate the

Determining a Science-Based Food Safety Objective/Appropriate Level of Protection for Application in Developing Countries. *European Journal of Risk Regulation* 8(2): 403-413.

[60] Gabrielle Marceau & Joel P. Trachtman (2014), A Map of the World Trade Organization Law of Domestic Regulation of Goods: The Technical Barriers to Trade Agreement, the Sanitary and Phytosanitary Measures Agreement, and the General Agreement on Tariffs and Trade. *Journal of World Trade* 48(2): 351-432.

[61] Jaffee & Henson, above n. 58, p. 2-3; Ming Du, above n. 59; Wahidin & Purnhagen, above n. 59.

[62] Simonetta Zarrilli (2000), *WTO Agreement on Sanitary and Phytosanitary Measures: Issues for Developing Countries*. In *UNCTAD, A Positive Agenda for Developing Countries: Issues for Future Trade Negotiations*.

[63] Jaffee & Henson, above n. 58, p. 5; Vogel, above n. 15, p. 3.

[64] John C. Beghin, Miet Maertens & Johan Swinnen (2015), Non-Tariff Measures and Standards in Trade and Global Value Chains. *Annual Review of Resource Economics* 7: 425-440, p. 7-8; Gregory Shaffer (2010), Risk Science, and Law in the WTO: The Centrality of Institutional Choice. *Proceedings of the 104th Annual Meeting of the American Society of International Law*, p. 19.

legitimacy of an SPS measure.[65] Nevertheless, even if SPS measures are not intentionally used to protect the domestic market, they do often restrict trade.[66]

1.4 Research questions

The aim of this dissertation is to advance the so far mostly simple accounts of WTO functions in relationship to the extraterritorial effect of domestic regulatory measures. WTO rules have been labelled as both a 'sword' and a 'shield' but the conceptualizations on which they are based miss a nuanced analysis taking into account the technicalities of WTO law. Existing scholarship in this field has covered various sectors, but SPS measures have remained understudied. This dissertation hence consists of a comprehensive analysis of the extraterritorial effect of domestic SPS measures from a WTO law perspective. The central research question this dissertation answers is: **In what ways does WTO law constrain or enable the extraterritorial effect of domestic sanitary and phytosanitary (SPS) measures?**

To address this question, the following three sub-questions were formulated.

1. *How does the extraterritorial effect of SPS measures impact trading partners in practice?*

The extraterritorial effect has been studied in various areas, but limited research has been done in the SPS sector. In order to study the influence of WTO law on the extraterritorial effect of SPS measures, it is necessary to understand how the extraterritorial effect impacts trading partners in practice. This research question first addresses whether an extraterritorial effect in the SPS sector can be observed, and then looks into the legal impacts of the extraterritorial effect of SPS measures.

2. *How is SPS law applied and interpreted as a 'sword' or 'shield' by the WTO Dispute Settlement Body?*

In order to study how SPS law may be used to prevent or enable the extraterritorial effect of measures, it is important to know how the law is applied. This research

[65] Sun Young Oh (2010), Incorporating Public Sentiment into a Science-Based Risk Analysis in WTO Laws. *Yonsei Law Journal* 1(2): 363-378, p. 364.
[66] Jaffee & Henson, above n. 58, p. 2-3.

question looks into two aspects of WTO law *in action*. First of all, it addresses how the WTO Dispute Settlement Body applies and interprets SPS law in trade disputes. Second of all, it studies the extent with which the rulings are complied.

3. *How do international regulatory standards influence the extraterritorial effect of SPS measures?*

The SPS Agreement encourages countries to adopt standards of international organizations in order to achieve harmonization. This research question addresses how international standards, both those endorsed by the SPS Agreement and those not, may be used to challenge measures with an extraterritorial effect.

1.5 Methodology

As argued above, there is a knowledge gap due to the abstract way in which the impact of WTO rules on the extraterritorial effect has previously been described. In order to conduct a technical analysis of WTO law, this research has been primarily undertaken through legal doctrinal analysis.

Legal doctrinal analysis is a 'critical conceptual analysis of all relevant legislation and case law to reveal a statement of the law relevant to the matter under investigation.'[67] For the doctrinal analysis first the relevant legislation and jurisprudence, both at WTO and national levels, were identified. Since the focus of the dissertation is on the extraterritorial effect of SPS measures, the sources at WTO level were primarily the SPS Agreement and the Panel and Appellate Body reports of trade disputes that invoked the SPS Agreement. The extensive use of trade dispute rulings allowed for a more systematic and technical analysis of the influence of WTO law on the extraterritorial effect of measures. At national level, domestic regulatory measures in the relevant fields, e.g. food safety and phytosanitary regulations, of the EU, US and South Africa were examined. Secondary sources used included government policy statements and scholarly writings.

To analyze these sources both textual and contextual interpretation were employed. Textual interpretation is defined as 'the action of explaining what a normative text

[67] Terry C. Hutchinson (2014), Valé Bunny Watson? Law Librarians, Law Libraries and Legal Research in the Post-Internet Era. *Law Library Journal* 106(4): 579-592, p. 584.

conveys by looking at the usual meaning of the words contained therein'[68]. In other words, it involves looking into the 'plain meaning' of the text and is used to understand the 'ordinary meaning to be attributed to the terms.'[69] This technique was used primarily to understand how WTO law is applied and interpreted in the jurisprudence. The WTO DSB is unique in that it not only clarifies and interprets WTO rules, but its rulings are binding on the parties in the dispute. Members are required to bring inconsistent measures into compliance with WTO law, and may face consequences if they do not. Although the WTO agreement interpretations by Panels and the Appellate Body are 'formally authoritative for the dispute being decided, not for others'[70] they are 'likely to have a kind of *de facto*[71] finality as interpretations of law, even if they lack *de jure*[72] finality'.[73]

In order to bring 'more interpretive depth'[74] to the legal doctrinal analysis[75], the analysis was expanded to the different contexts[76] in which they are embedded. This was done by engaging with research of other disciplines and using insights from political (economic) analysis, business analysis and comparative institutional analysis. These contextual analyses are further elaborated in the chapters. Secondary sources such as scientific experiments, technical government working party documents, trade statistics, news articles, scholarly writings and informal interviews were used. Insights from these sources were then extrapolated to the legal doctrinal analysis in order to place the law into a broader context. The specific contexts applied and data sources used are discussed further in section 1.6.

[68] Koen Lenaerts & Jose A. Gutierrez-Fons (2013), To Say What the Law of the EU is: Methods of Interpretation and the European Court of Justice. *EUI Working Papers,* AEL 2013/9, p. 6.
[69] Andrea Bianchi (2010), *Textual Interpretation and (International) Law Reading: The Myth of (In)determinacy and the Genealogy of Meaning*. Cambridge University Press, p. 34-55.
[70] Isabella van Damme (2010), Treaty Interpretation by the WTO Appellate Body. *European Journal of International Law* 21(3): 605-648, p. 610.
[71] Meaning what happens in practice even though not formally recognized by law
[72] Meaning what happens in law
[73] Robert Howse (2003), *The Most Dangerous Branch? WTO Appellate Body Jurisprudence on the Nature and Limits of the Judicial Power*. In Thomas Cottier and Petros C. Mavroidis (Eds), *The Role of the Judge in International Trade Regulation*. University of Michigan Press, p. 11, 15.
[74] Matyas Bodig (2015), Legal Doctrinal Scholarship and Interdisciplinary Engagement. *Erasmus Law Review* 8(2): 43-54, p. 43.
[75] Ibid., p. 50.
[76] Lenaerts & Gutierrez-Fons, above n. 76, p. 13.

The specific methodology applied in this dissertation allowed for a more nuanced examination of the technicalities of WTO law. Through the legal doctrinal analysis embedded in contexts of other disciplines it was possible to better conceptualize the role of WTO law in relationship to the extraterritorial effect.

1.6 Structure of the dissertation

Chapter 2 investigates the impact of the WTO Dispute Settlement system on challenging the extraterritorial effect. Three WTO disputes are examined to determine whether the WTO constrains or facilitates the 'Brussels Effect'. This chapter looks at not only the results of the official dispute settlement documents, but also beyond them in order to study the impact of the dispute settlement system *in action*. These disputes were therefore selected specifically because enough time had lapsed after the dispute settlement rulings in order to study the compliance with the rulings and if any extraterritorial effect were still present. This chapter required a political analysis to study the impact of WTO rules on the countries on both sides of the Brussels Effect. In addition to the corresponding Panel and Appellate Body reports, various national regulations, policy statements, trade statistics and scholarly writings are examined to conduct the analysis.

Chapter 3 presents a practical example of the extraterritorial effect and shows how it may lead to upward harmonization. The phytosanitary trade dispute on citrus black spot disease between the EU and South Africa is used to illustrate this effect. This chapter included insights from political economy and business analysis to interpret the effects of the law in practice. An extensive literature review of information on the trade dispute and its effects on South Africa was conducted. A variety of sources was used, including official statements from governments, working party documents, scholarly writings, scientific experiments, news articles and informal interviews. The issue of the open interpretations of science and risk in the SPS Agreement and how they may provide a leeway for countries to extraterritorialize their standards is also addressed. Previous similar WTO disputes were selected to estimate a benchmark that could be used in this dispute.

Chapter 4 presents a detailed analysis of a provision that may be used to challenge measures with an extraterritorial effect. Article 5.6 of the SPS Agreement states that measures should not be more trade-restrictive than required to achieve a country's

appropriate level of protection (ALOP). This chapter consists of an empirical, systematic analysis of all 20 disputes[77] that invoked the provision, using qualitative content analysis software (Atlas.ti7). The aim is to generate insights into the current and future use of Article 5.6 SPS in WTO litigation and the implications for WTO Members' regulatory powers to take SPS measures. It focuses on which aspects of the cases were most likely to lead to a ruling of an Article 5.6 violation and how these may be used to strike down measures not in compliance with SPS law.

Chapter 5 serves as a control in assessing the role of international organizations in the vacuum of WTO law. In the vegetable seed industry, countries have widely diverging phytosanitary standards, many of which are not based on science. Through an institutional analysis the role of relevant international organizations in setting standards and achieving harmonization are examined, and the question of harmonization as a goal is addressed.

The concluding chapter answers the research questions and engages in a discussion of the role of science and international standards. It also provides an overview of the main contributions of this dissertation to the academic literature, as well as the policy implications and recommendations.

[77] WTO, *Dispute Settlement: Disputes by Agreement.* Accessed 12 July 2017, https://www.wto.org/english/tratop_e/dispu_e/dispu_agreements_index_e.htm?id=A19.

Table 1.1. Structure of the dissertation

Chapter	Title	Answer to research question
1	General introduction General introduction	
2	Reversed harmonization or horizontalization of EU standards? Does WTO law facilitate or constrain the Brussels Effect?	1, 2
3	When life gives you lemons: The 'battle of science' on the correct interpretation of data on citrus black spot disease between the European Union and South Africa according to the SPS Agreement	1, 2
4	The potency of the SPS Agreement's 'excessivity test': The impact of Article 5.6 on trade liberalization and the regulatory power of WTO members to take sanitary and phytosanitary measures	2, 3
5	The role of international organizations in the harmonization of phytosanitary standards for vegetable seeds	3
6	Conclusions and general discussion	

Chapters 2-4 have been published in international peer-reviewed scientific journals. Chapter 2 was published as '*Reversed harmonization or horizontalization of EU standards? Does WTO law facilitate or constrain the Brussels Effect?*' in the Wisconsin Journal of International Law. Chapter 3 was published as '*When life gives you lemons: The "Battle of Science" on the correct interpretation of data on citrus black spot disease between the European Union and South Africa according to the SPS Agreement*' in Trade, Law and Development. Chapter 4 was published in the Journal of International Economic Law, titled '*The potency of the SPS Agreement's Excessivity Test: The impact of Article 5.6 on trade liberalization and the regulatory power of WTO members to take sanitary and phytosanitary measures*'.

CHAPTER 2

Reversed harmonization or horizontalization of EU standards? Does WTO law facilitate or constrain the Brussels Effect?

Abstract[78]

European Union (EU) law establishes an internal market. To achieve that goal, it acts to a large extent as a regulator, setting standards. These standards are often legally binding inside of the jurisdiction of the EU, but increasingly travel beyond the borders of the EU on the back of traded goods. In some areas, this leads to a "Brussels Effect," where EU standards factually harmonize legislation at transnational level, creating a "race to the top" in international standards. This generates a level playing field for transnational trade, directed by the EU as a *de facto* transnational regulator. Professor Anu Bradford brought forward the argument that a *de facto* or *de jure* transnational harmonization by EU standards might be facilitated or constrained by the World Trade Organization (WTO). The WTO could strike down such regulations as purely domestic ones without taking into account that these EU-standards have factually already achieved what the WTO aspires: removing barriers to trade between its member countries by establishing equal treatment of all trading partners as the norm. We will call this phenomenon of the Brussels Effect the Reversed Harmonization Effect. The WTO could also facilitate the Brussels Effect by providing a specific forum for negotiations, which favors the EU as a dominant regulator, leading to a horizontalization of standards across the WTO. One may hence claim normatively that the WTO should take into account a broader view on the economic effect of these measures beyond their formal domestic jurisdiction by differing between domestic and horizontalized standards.

This piece examines whether this normative claim is well-founded in the law of the WTO using the example of food trade. We will investigate whether current WTO law as applied "in action" has the potential to facilitate or constrain the Brussels Effect. Three famous trade disputes are analyzed to investigate this hypothesis. We conclude that, in the areas investigated, WTO law has very limited potential to jeopardize the Brussels Effect. From our study, we hence find no evidence that would support such a normative claim.

[78] This chapter was published as Dominique Sinopoli & Kai Purnhagen (2016), Reversed Harmonization or Horizontalization of EU Standards? Does WTO Law Facilitate or Constrain the Brussels Effect*? Wisconsin Journal of International Law* 34(1): 92-119.

2.1 Introduction

Critics of globalization argue that free trade leads to a 'race to the bottom', in which governments lower their regulatory standards to attract economic activity and improve their competitive position in the global market.[79] They fear that this may lead to a downward harmonization of standards.[80] Other scholars have challenged this claim and shown that trade liberalization instead frequently triggers a 'race to the top', which is the idea that regulatory standards are being driven upward and strict standards may actually form a competitive advantage.[81] Vogel described this phenomenon as the California Effect: Trade and agreements to promote [regionalization and globalization] affect not only the flow of goods among nations, but also the movement of regulations across national boundaries. Nations are thus increasingly importing and exporting standards as well as goods.[82]

Bradford builds upon the California Effect by examining the global regulatory power of the European Union (EU).[83] The Brussels Effect she describes provides an example of a dominant regulator whose power leads to the harmonization of global standards. The EU exports its standards to the rest of the world and sets the global rules in a range of areas, such as competition, privacy, environment, chemicals, and food, resulting in a 'Europeanization' of global regulatory standards.[84] Bradford identified various factors that may place limits on the Brussels Effect—one of which is the law of international organizations such as the World Trade Organization (WTO).[85]

This paper takes the next step and seeks to further explore the proposition that the WTO places limits on the Brussels Effect. It is expected that if the WTO indeed constrains the global regulatory power of the EU, the Brussels Effect will be greater where EU and WTO laws diverge. Previous findings on the impact of WTO laws on influencing the interplay of EU data protection laws on United States (US) data privacy standards have already illustrated that WTO rules can work as both a shield and a sword.[86] In analyzing the influence of the EU's data protection Directive on US standards, Shaffer illustrated that

[79] Cary, above n. 14; Tonelson, above n. 14, p. 14-15.

[80] Silverglade, above n. 14.

[81] Vogel, above n. 15; Vogel & Kagan, above n. 15, p. 3; Shaffer, above n. 5; Shaffer, above n. 6.

[82] Vogel, above n. 16, p. 2.

[83] Bradford, above n. 1.

[84] Ibid., p. 3.

[85] Ibid., p. 55-56.

[86] Shaffer, above n. 5; Shaffer, above n. 6, p. 419-437.

international trade liberalization rules did not have a significant impact on 'the ability of governments to require greater social protection'.[87] Even more, international trade law often does not have any impact on the extra-jurisdictional effects of social data protection law.[88] Subsequently, several scholars looked more comprehensively into the phenomenon of the extraterritoriality of specific EU regulatory regimes such as competition law[89] and the law of chemicals.[90] More than a decade after Gregory Shaffer's analysis, Joanne Scott took up this 'extraterritorial' reach of EU law as a basis to comprehensively analyze the territorial extension of EU law in the areas of environmental law, aviation law, and the law of financial markets.[91] With respect to the topic of whether WTO law might constrain such an extraterritorial Brussels Effect, she contends that WTO law may permit an extraterritorial reach of EU laws if they are 'sufficiently flexible'.[92] These pieces have comprehensively looked at the extraterritorial application of EU law in a variety of specific fields. What unites these pieces is that they apply a specific European Union-centered analysis. A thorough analysis of the effects of WTO laws on this extraterritorial effect from the perspective of WTO law is missing, which we will provide in turn. In order to keep the level of analysis comprehensible we will focus on the area of food safety and quality regulation. This highly important and relevant area is becoming increasingly transnational and is one that 'directly, personally and continually affect(s) the well-being of every citizen'.[93] There are several famous international trade disputes in this area and many political and social tensions surrounding food regulation. We will use various trade issues in the area of food safety to investigate this hypothesis.

What is ironic is that, if the Brussels Effect indeed leads to harmonization of food safety standards, then it is line with the aims of the WTO: levelling trade barriers and non-discrimination.[94] If the WTO constrains the Brussels Effect, however, then it may actually work against these goals as a form of reversed harmonization. It is therefore

[87] Shaffer, above n. 5.

[88] Shaffer, above n. 6, p. 426-429.

[89] Wagner-von Papp, above n. 47.

[90] Scott, above n. 2.

[91] Scott, above n. 26.

[92] Ibid., p. 115-116.

[93] Christopher Ansell & David Vogel (2006), *The Contested Governance of European Food Safety*. In Christopher Ansell & David Vogel (Eds.), *What's the Beef: The Contested Governance of European Food Safety Regulation*. MIT Press.

[94] As former Director-General Pascal Lamy stated, 'The WTO's founding and guiding principles remain the pursuit of open borders, the guarantee of most-favoured-nation principle and non-discriminatory treatment by and among members, and a commitment to transparency in the conduct of its activities' (WTO, n.d.).

ironic that what may be considered a trade barrier can actually lead to harmonization. This proposition will be further explored in the analysis section.

Sections 2.2 and 2.3 provide a foundation for the article. Section 2.2 includes background information on the Brussels Effect: what it is, how unilateral regulatory globalization works, and which factors, such as the WTO, may place limits on the effect. Section 2.3 examines the harmonization approach of the WTO through the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) and the Codex Alimentarius Commission, and the relationship with the Brussels Effect. Section 2.4 identifies cases of the Brussels Effect in the food sector. Food-related trade issues raised in the Dispute Settlement Understanding (DSU) system are selected and subsequently analyzed for incidence of the Brussels Effect. The cases are assessed to determine if WTO law constrains the Brussels Effect. Section 2.5 addresses the hypothesis that the Brussels Effect is greater where WTO law and law of the dominant regulator diverge. It is important to keep in mind that dominant regulators may push for international treaties that force their own standards on other nations.[95] Therefore, the relationship between dominant regulators and the Codex Alimentarius Commission is also addressed. The possible ironic situation that the WTO constrains the Brussels Effect even though it leads to harmonization is also examined.

While it is recognized that there are likely many instances of the Brussels Effect beyond what are reported in trade disputes, the limit will be on cases in which the WTO has been involved, since the focus of this paper is on the role of the WTO. Therefore, there is a lot that lies outside the scope of this article. Three cases have been selected for this study, chosen according to what the authors believed to be ones which best illustrate the possible constraint to the Brussels Effect. The criteria we chose from were: food-related disputes, variety in measures, and involvement of the EU or the US as a dominant regulator. In order to allow for a sound analysis of the effects, we chose established settlements where a sufficient time span elapsed after they became published. For this reason, we also refrained from basing our analysis on more recent settlements.

The challenges of launching a case within the WTO Dispute Settlement system mean that countries are likely to do so only when they expect a positive outcome. Considerable efforts and resources are required to raise a WTO case, particularly for developing

[95] Beth Simmons (2004), *The International Politics of Harmonization: The Case of Capital Market Regulation.* In David Vogel & Robert A. Kagan (Eds.), *Dynamics of Regulatory Change: How Globalization Affects National Regulatory Policies*. University of California Press, p. 50-51.

countries. Additionally, countries may have other reasons not to raise an issue within the WTO, such as to avoid media attention on a particular topic[96] or to avoid further tensions. Downes has warned of the limitations of extrapolating from WTO disputes, since the cases may be too specific to apply the results elsewhere, and because it is not always clear if regulations applied are a result of the SPS Agreement or the legal strategy of a jurisdiction.[97] Therefore, it is recognized that the conclusions drawn in this paper do not necessarily apply to all cases concerning the Brussels Effect and the WTO. However, unlike national law, WTO black letter law is the outcome of a political compromise between contracting parties which does not lend itself to solving detailed questions. In fleshing out the WTO legal system, the WTO dispute settlement regime hence also plays a much stronger role in law-creation than in national regimes. While the specifics of each individual case do not lend themselves to extrapolate the outcomes of the dispute to other cases, the generalized reasoning of the WTO dispute settlement institutions on the WTO legal system need to be taken into account when interpreting the WTO legal system.

2.2 Brussels Effect

This section will provide the basis for the analysis to come. We will first explain the Brussels Effect (section 2.2.1.), before we move on to illustrate how we will apply the phenomenon of the Brussels Effect in this paper (section 2.2.2).

2.2.1 Background

The Brussels Effect provides an example of a dominant regulator whose power leads to the harmonization of global standards. The European Union exports its standards to the rest of the world, and sets the global rules in a range of areas, such as competition, privacy, environment, chemicals and food, resulting in a 'Europeanization' of global regulatory standards.[98] Bradford identified various factors which may place limits on the Brussels Effect—one of which is international organizations such as the WTO.[99]

[96] Pollack & Shaffer, above n. 46, p. 179.

[97] Chris Downes (2014), *The Impact of WTO SPS Law on EU Food Regulations*. Springer, p. 110-111.

[98] Bradford, above n. 1.

[99] Ibid., p. 6.

The EU has the world's largest internal market, supported by strong regulatory institutions. Trading with the EU requires foreign companies to adjust their conduct or production to EU standards—which often represent the most stringent standards—or else forgo the EU market entirely. Rarely is the latter an option. While the EU regulates only its internal market, multinational corporations often have an incentive to standardize their production globally and adhere to a single rule. This converts the EU rule into a global rule—the '*de facto* Brussels Effect'. Finally, after these export-oriented firms have adjusted their business practices to meet the EU's strict standards, they often have the incentive to lobby their domestic governments to adopt these same standards in an effort to level the playing field against their domestic, non-export-oriented competitors—the '*de jure* Brussels Effect'.[100]

Market forces are strong enough to create 'involuntary incentives' for businesses to adjust to stricter standards. Even though exporting businesses would prefer other standards, they reluctantly adopt EU standards due to the opportunity costs of not doing so. Bradford identifies five conditions for this phenomenon, called unilateral regulatory globalization:

1) market power;[101]
2) regulatory capacity;[102]
3) preference for strict rules;[103]
4) predisposition to regulate inelastic targets;[104] and
5) nondivisibility of standards.[105]

The Brussels Effect occurs only when the exporter applies the stricter EU standards to all of its products or services, whether they are exported to the EU or elsewhere in the world. An exporter has an incentive to do this when it is more cost effective to adopt a single global standard rather than adjust production to meet varying regulatory standards.[106]

[100] Ibid., p. 6.
[101] Ibid., p. 11-12.
[102] Ibid., p. 12-14.
[103] Ibid., p. 14-16.
[104] Ibid., p. 16-17.
[105] Ibid., p. 17-19.
[106] Ibid., p. 48.

The Brussels Effect does not occur in all instances of trade. Various external and internal factors place limits on the 'Europeanization' of global standards:[107]

1. *Alternative markets*: The EU has limited regulatory power in certain areas where alternative markets exist. Businesses are currently typically not willing to forgo the large EU market. However, as demand grows in emerging markets, businesses will no longer be so dependent on the EU market for their products and services;
2. *Other nations*: Other nations may wish to constrain the Brussels Effect: strict EU standards may be perceived negatively in other countries. Additionally, the regulatory power of the EU is limited in cases where other nations have regulatory standards higher than those of the EU;
3. *International institutions*: The World Trade Organization (WTO) works to lower trade barriers. Countries are not allowed to restrict imports from countries with more lenient standards unless they can prove it is necessary for the goals stipulated in the respective legal regimes (GATT, SPS Agreement);
4. *Internal conflicts*: Internal conflicts and growing diversity within the EU, especially as more nations are joining the Union, place constraints on the Brussels Effect. Not all consumers and businesses within the EU benefit from strict regulatory standards.[108]

2.2.2 Application

In this paper, the Brussels Effect is considered to be the concept of a dominant regulator who exports its standards to the rest of the world, leading to the harmonization of global standards either by law or factual economic power. It is recognized that this concept is not only limited to the EU, but can be applied to the US or other countries that may be the dominant market in some cases. The US in particular was more powerful in the past few decades, a role that the EU is now filling; therefore the US showed instances of the Brussels Effect during that period. In this paper examples of the Brussels Effect are shown with the EU and US as dominant regulators.

[107] Ibid., p. 48-63.

[108] Ibid., p. 62-63.

2.3 World Trade Organization and trade in foods

Food regulations are (mostly) national or regional, yet trade is global, creating problems of 'linkage'.[109] International trade problems occur when countries and regions have different regulations and businesses or authorities are confronted with multiple requirements.[110] Differences in technical standards such as labelling requirements and premarket approvals are examples of non-tariff barriers. At the global level, the WTO and its agreements play a major role in reducing barriers to international trade and promoting the harmonization of national regulations.[111] We will look into how the relevant WTO agreements might influence the Brussels Effect in trade in foods. To this end, we will first illustrate how the WTO *de facto* regulates the world food market (section 2.3.1), and how this has changed the authority of the Codex Alimentarius (section 2.3.2).

2.3.1 SPS and TBT Agreements

Although there are several international organizations that frame international trade law, the WTO is the only one that has the power to issue legally binding obligations upon its Members.[112] Although a huge number of disputes on WTO law concern trade in foods, food safety has never been a prime issue for the WTO.[113] This comes as no surprise, as the WTO is primarily an organization that aims to remove barriers to trade between its Member States, by establishing equal treatment of all trading partners as the norm.[114] The WTO has, however, become the major international *de facto* regulator in global food trade.[115] The regulatory gate through which food safety travels to WTO law is Art. XX(b)

[109] Dennis Patterson & Ari Afilalo (2008), *The New Global Trading Order*. Cambridge University Press, p. 86-93.
[110] Ibid.
[111] Bernard M. Hoekman & Petros C. Mavroidis (2007), *The World Trade Organization: Law, Economics and Politics*. Routledge.
[112] Alberto Alemanno (2007), Trade in Food: Regulatory and Judicial Approaches in the EC and the WTO. *Journal of International Economic Law* 11(2), p. 227.
[113] Huei-chih Niu (2006), A Comparative Perspective on the International Health Regulations and the World Trade Organization's Agreement on the Application of Sanitary and Phytosanitary Measures. *Asian Journal of WTO & International Health Law and Policy* 1(2): 513-542, p. 515.
[114] Kai Purnhagen & Bernd van der Meulen (2016), *Consumer Protection Legislation*. In Benjamin Caballero, Paul Finglas, Fidel Toldrá (Eds.), *Encyclopedia of Food and Health*. Elsevier, p. 296-300.
[115] Alessandra Arcuri (2014), The Coproduction of the Global Regulatory Regime for Food Safety Standards and the Limits of a Technocratic Ethos. *Robert Schuman Centre for Advanced Studies Research Paper No. RSCAS*

GATT,[116] which recognizes that certain exceptions to free trade can be necessary to protect social values such as health and (food) safety.[117] The Article is further substantiated in the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement),[118] which applies to all sanitary and phytosanitary measures (SPS measures) that may affect international trade. In addition, the Agreement on Technical Barriers to Trade (TBT Agreement)[119] aims to ensure that technical regulations and standards are non-discriminatory and do not create unnecessary obstacles to trade. In line with the trade rationale of WTO law, these agreements aim to harmonize measures around the world in order to create market access at an equal level for all Member States. The level of harmonization is determined by international standards, guidelines, or recommendations, where they exist.[120] If measures of a Member State conform to these international measures, then they are presumed to be consistent with WTO law.[121] WTO law does not completely turn a blind eye to food safety concerns, however: Members may apply SPS measures that result in a higher level of protection than would be achieved by measures based on international standards if there is a scientific justification to apply a stricter standard,[122] and if it is not inconsistent with the other requirements of the Agreement, such as non-discrimination and not a disguised restriction on international trade.[123]

2.3.2 Codex Alimentarius

The SPS Agreement states that if food safety measures are based on standards, guidelines, or recommendations established by the Codex Alimentarius Commission, then they are presumed to be consistent with WTO law (Annex A, 3(a)), thereby making the Codex Alimentarius Commission a *de facto* global regulator.[124] The Codex Alimentarius Commission was established in 1963 with the purpose of minimizing

2014/97; David E. Winickoff & Douglas M. Bushey (2010), Science and Power in Global Food Regulation: The Rise of the Codex Alimentarius. *Science, Technology & Human Values* 35(3): 356-381.

[116] General Agreement on Tariffs and Trade. July 1986 (GATT).

[117] Purnhagen & van der Meulen, above n. 114.

[118] WTO, Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement).

[119] WTO, Agreement on Technical Barriers to Trade (TBT Agreement).

[120] Article 3.1 SPS Agreement, Article 2.4 TBT Agreement.

[121] Article 3.1 SPS Agreement.

[122] Article 3.3 SPS Agreement.

[123] Article 2 SPS Agreement. See in detail on this observation Downes, above n. 97, p. 91-126.

[124] Arcuri, above n. 115; Winickoff & Bushey, above n. 115.

international trade barriers through the promotion of harmonized food standards.[125] For decades its standards were entirely voluntary: they served (and still do) as model regulations for national legislation[126] and private standard setters.[127] As Codex standards were hence perceived of only 'marginal importance',[128] countries were entirely free to ignore Codex standards.

When the SPS Agreement came into force in 1995, the Codex Alimentarius Commission was named as an organization that can establish international standards for food safety.[129] It has since gained considerable legal authority.[130] Codex standards are now used by WTO dispute panels for resolving trade issues, to help determine whether national food safety regulations are non-tariff barriers or not.[131] 'With the adoption of the SPS Agreement, states have delegated significant authority to supranational bodies to set and enforce food safety rules and standards and have agreed to be bound by the decisions of bodies that adjudicate disputes that arise over these rules'.[132] WTO members can either base their measures on Codex Alimentarius standards or deviate from them and provide scientific evidence demonstrating that stricter standards are necessary for life or health purposes.[133] In practice, conforming with Codex provisions can create a presumption of compliance with international law and therefore lower the

[125] Codex Alimentarius Commission, *Codex Timeline from 1945 to the Present*, Accessed 1 February 2016, http://www.codexalimentarius.org/about-codex/codex-timeline/en/.

[126] See on the intertwindedness of national actors and Codex Jessica Vapnek & Melvin Spreij (2005), Perspectives and Guidelines on Food Legislation, with a New Model Food Law. *FAO Legislative Study 87*, p. 31-34.

[127] Kai Purnhagen (2015), Mapping Private Regulation – Classification, Market Access and Market Closure Policy, and Law's Response. *Journal of World Trade* 49(2): 309-324.

[128] Downes, above n. 97, p. 205.

[129] Vapnek & Spreij, above n. 126, p. 38.

[130] Michael A. Livermore (2006), Authority and Legitimacy in Global Governance: Deliberation, Institutional Differentiation, and the Codex Alimentarius. *New York University Law Review* 81: 766-801; Ravi Alfonso Pereira (2010), Why Would International Administrative Activity Be Any Less Legitimate? - A Study of the Codex Alimentarius Commission. *German Law Journal* 9(11): 1693-1718; Winickoff & Bushey, above n. 115; Grace Skogstad (2001), The WTO and Food Safety Regulatory Policy Innovation in the European Union. *Journal of Common Market Studies* 39(3): 485-505; Codex Alimentarius Commission, *About Codex*. Accessed 12 July 2017, http://www.codexalimentarius.org/about-codex/en/.

[131] Vapnek & Spreij, above n. 126, p. 38.

[132] Grace Skogstad (2001), Internationalization, Democracy, and Food Safety Measures: The (Il)Legitimacy of Consumer Preferences? *Global Governance* 7(3): 293-316.

[133] David G. Victor (2004), *WTO Efforts to Manage Differences in National Sanitary and Phytosanitary Policies*. In David Vogel & Robert A. Kagan (Eds.), *Dynamics of Regulatory Change: How Globalization Affects National Regulatory Policies*. University of California Press, p. 230-231.

threat of potential costs of litigation before the WTO.[134] The WTO legal system therefore provides a huge incentive for businesses to comply with Codex standards instead of relying on their own risk assessment.

2.4 Does WTO law facilitate or constrain the Brussels Effect?

This section will discuss whether the WTO trade regime in foods described in brief above relates to the Brussels Effect. We will first illustrate how this regime incentivizes dominant regulators to push for the recognition of their domestic food standards at WTO level. We will conclude, however, that this incentive does not facilitate the Brussels Effect (section 2.4.1). Subsequently we analyze Bradford's claim that the WTO regime may limit the Brussels Effect for the area of food trade.[135] We will show with the example of three cases settled at WTO level (genetically modified organisms (GMOs),[136] hormones,[137] and dolphin/tuna[138] that the WTO food regulation regime has very limited potential to constrain the Brussels Effect (section 2.4.2). The evidence from the case studies presented here therefore do not support Bradford's proposition.

2.4.1 Does the WTO food law regime facilitate the Brussels Effect?

Codex standards have factually become a binding authority in the WTO. What looks like a victory for transnational standardization has a considerable impact on the balance of power between WTO Members. As Member States are more concerned about what they include as a Codex standard, national legislators now 'have an incentive to bring Codex standards more closely in line with domestic policy goals since the negative domestic consequences of adopting an international standard are least when the divergence

[134] Downes, above n. 97, p. 205-206.

[135] Bradford, above n. 1, p. 54. Bradford acknowledges later in her paper that this claim at the beginning might not be as watertight as her initial claim makes us believe and that there is a potential that the WTO might even facilitate the Brussels Effect, p. 56.

[136] Panel Report, *European Communities – Measures Affecting the Approval and Marketing of Biotech Products* (EC – Approval and Marketing of Biotech Products), WT/DS291/R, WT/DS292/R, WT/DS293/R (29 September 2006).

[137] Panel Report, *European Communities – Measures Concerning Meat and Meat Products* (EC – Hormones), WT/DS26/R/USA (18 August 1997).

[138] Panel Report, United States – *Measures Concerning the Importation, Marketing and Sale of Tuna and Tuna Products* (US – Tuna II (Mexico)), WT/DS381/R (15 September 2011).

between the international standard and the optimal domestic regulation are smallest'.[139] Codex standards now 'act to restrict and structure the policy choices of states'.[140] It is likely that those trading blocs with bigger negotiation power will dominate negotiations on transnational setting of standards, conventionally investigated as a north/south conflict.[141] In this sense, the new Codex role in WTO law accelerates the already existing risk that dominant regulators may push for international treaties that impose their own standards on other countries.[142] 'If national administrators are encouraged to believe that their policy options will be unduly constrained by international law, this may change the way they interact with other countries in international bodies, such as Codex Alimentarius, aimed at facilitating and managing the global food trade'.[143] As such bigger trading blocs include the EU or the US, the impact of their regulations on the Codex Alimentarius Commission and the WTO also need to be addressed.

As the EU is largely dependent on imports from WTO member countries for a large number of foodstuffs,[144] the negotiation power of the EU is likely to be limited in the area of food law in cases where alternative markets exist. In addition, the EU might be a strong trading block in the WTO but it is not the only one. To achieve voting power, the EU would at least have to have China and the US in the boat when enforcing its standards in WTO disputes. Given the fact that quarrels between the US and the EU over food standards are often subject to WTO disputes,[145] it is not likely that such consensus will be easy to reach. What is however likely is that the WTO will see (or already sees) a north/south conflict, where standards set by northern countries dominate southern ones.[146] It is therefore unlikely that the trading bloc's increased interest to enforce its standards in WTO disputes will lead to an increase of EU standards, a fact that is important for making our argument in this piece. The fact that Codex provisions have become factually binding law means they are unlikely to increase the Brussels Effect.

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[139] Livermore, above n. 130, p. 786.

[140] Ibid., p. 778.

[141] Karin Mickelson (2000), South, North, International Environmental Law, and International Environmental Lawyers*. Yearbook of International Environmental Law* 11: 52-81, p. 54 (for similar developments in international environmental law).

[142] Simmons, above n. 95, p. 50-51.

[143] Downes, above n. 97, p. 2-3.

[144] Eurostat (2013), *EU-27 – Trade Balance with EXTRA EU-27*, http://ec.europa.eu/agriculture/statistics/trade/2012/eur27ag/page_147.pdf.

[145] See as an example the WTO trade dispute with the USA over GMO regulation, for details Pollack & Shaffer, above n. 46, 177-234.

[146] Mickelson, above n. 141, p. 54 (for similar developments in international environmental law).

2.4.2 Does the WTO legal regime constrain the Brussels Effect?

In this section we elaborate on whether the WTO regime limits the Brussels Effect in the area of food trade, leading to what we call reversed harmonization. Bradford has brought forward the claim that the WTO regime is one of five factors that may put limits on the Brussels Effect.[147] By analyzing dispute settlement reports on 1) GMOs, 2) hormones, and 3) dolphin/tuna at WTO level, we will show that, at least within the limits of the cases analyzed, the contrary is true: The WTO food regulation regime has very limited potential to hinder the Brussels Effect.

2.4.2.1 GMOs

Bradford presented GMOs as one of five cases demonstrating the Brussels Effect.[148] In 2003, the US,[149] Canada,[150] and Argentina[151] challenged the EU's *de facto* moratorium and its member state bans on GMOs.[152] The moratorium and bans restricted imports of agricultural and food products from the complainant countries, among others. A panel was established later that year.

The panel ruled in favor of the US, Canada, and Argentina, but mainly for procedural reasons. The panel avoided making a decision of whether or not GMOs pose a risk to health and whether the EU had based its decision on a risk assessment.[153] It instead targeted the EU's moratorium which had been in place from June 1999 to August 2003 and found that the EU's excessive delays in the GMO approval process were in violation

[147] Bradford, above n. 1, p. 54.

[148] Ibid., p. 32-35.

[149] Panel Report, EC – Approval and Marketing of Biotech Products, above n. 136.

[150] Ibid.

[151] Ibid.

[152] See for details Pollack & Shaffer, above n. 46, p. 177-234.

[153] There is no Codex Alimentarius standard on GMOs. It states on the website: 'Codex is strongly committed to promote safe foods. Amongst safe foods, Codex does not give any preference to certain kinds of foods over others. Such choice belongs to consumers. Codex has adopted principles and guidelines to assess food safety of foods derived from recombinant-DNA plants, animals and microorganisms. If a government chooses to build a regulatory mechanism to address the food safety of so-called GM foods, then they can use Codex text as a basis for it. This being said, each government is free to adopt its own policy as to the use of GM organisms in the agriculture and other sectors. At the moment, there are no internationally-agreed recommendations on the food labelling of GM foods. Governments are therefore applying their own regulations.' From Codex Alimentarius Commission, *FAQs – Questions about Specific Codex Work*. Accessed 12 July 2017, http://www.codexalimentarius.org/faqs/specific-codex-work/en/.

of Article 8 (regarding approval procedures) and Annex C(1)(a) (which states that approval procedures should be undertaken and completed without 'undue delay') of the SPS Agreement. The EU announced its intention to implement the recommendations and rulings of the panel.[154]

The EU in the case of GMOs shows most elements of a Brussels Effect. The EU has built the regulatory capacity that allows it to influence regulation of GMOs. GMOs also work very well within the framework of the Brussels Effect: they are considered to be an inelastic product, because regulation cannot be avoided by moving the regulatory targets (i.e. consumers) to another jurisdiction. GMOs are non-divisible products in practice.[155] Although it is possible to grow GM and conventional crops on different fields, it is very difficult to prevent transfer of seeds and crops by the wind or other means. Additionally, crops would have to be segregated through all processing and distribution steps, including 'separate equipment, storage areas, and shipping containers, and establish trait identification systems that allow for the tracking of produce from the farm to the consumer'.[156] To try to segregate GM and conventional crops is at best very expensive, and very difficult if not impossible to execute. GM crops are therefore nondivisible in practice.

It is less clear, however, if the EU has the required market power. The EU is only the US' fifth largest export market, making up 8 percent of US agricultural exports.[157] Therefore it appears that farmers and producers should be able to forgo the EU market and sell their products elsewhere. The EU has, however, already influenced many other countries, such as Australia, Brazil, China, and Japan who are posing restrictions on GM products and are requiring labeling for GMOs and their products.[158] The US is therefore more limited in diverting its agricultural and food products elsewhere.[159] Nevertheless, the US has displayed limited evidence of 'trading up'.[160]

[154] WTO Dispute Settlement Body meeting, 19 December 2006, cited in WTO summary of Dispute DS291, https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds291_e.htm.
[155] Bradford, above n. 1, p. 33-34.
[156] Ibid., p. 34.
[157] Ibid., p. 33.
[158] Ibid., p. 33.; Vogel, above n. 16, p. 89.
[159] Bradford, above n. 1, p. 33.
[160] Ibid., p. 33; FDA (1992), *Statement of Policy – Foods Derived from New Plant Varieties*, http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/Biotechnology/ucm096095.htm.

It can be argued that the US also displayed elements of a Brussels Effect in the case of GMOs. Both the US and the EU pushed their views on other countries and tried to convince them to support or be against GMOs. For example, the United States Department of Agriculture (USDA) stated one of its goals is 'to facilitate the marketing of bioengineered products in both the domestic and international markets'.[161] For example, in 2001, the Chinese government communicated to the US that they would accept US safety certifications for GMO crops.[162] Several months later the Chinese officials reversed their decision, and the US stated that it was 'unacceptable'.[163] The Chinese government responded by issuing temporary safety certificates allowing GMO imports, and within two years permanent regulations were enacted. One Non-Governmental Organization (NGO) official complained 'the U.S. is trying to impose its standards on the rest of the world'.[164] Many developing countries, including India, Brazil, South Korea, Egypt, Kenya, South Africa, and Thailand have become more accepting of GMO products, by approving crops or having pilot programs.[165]

The EU has also shown similar examples of trying to impose its standards of anti-GMO regulations on other countries. Thanks to the EU's six-year moratorium on GMO imports, many trade-dependent countries had to adapt to EU law. Not only the moratorium tied other countries to EU GMO regulation, however: The Bablok case requires all honey imported into the EU which contains GMOs to undergo an authorization procedure for GMO products. [166] As virtually any honey has the potential to contain GMOs,[167] and importers may not always file for such an authorization procedure, planters of GMO crops near bee hives all around the world run into liability risks if a bee collects GM pollen which contaminates the honey.[168] In this way, EU GMO regulation has the potential to regulate farming around the globe with very strict standards.[169] Zambia's

[161] USDA (2007), *Agricultural Biotechnology—Frequently Asked Questions*. Cited in Daniel W. Drezner, *All Politics Is Global*. Princeton University Press, p. 166.
[162] Daniel W. Drezner (2007), *All Politics Is Global*. Princeton University Press, p. 166.
[163] Ibid., p. 166-167.
[164] Ibid., p. 167.
[165] Ibid., p. 167-168.
[166] Case C-442/09, Bablok and Others v. Freistaat Bayern, 2011 E.C.R. I-7419.
[167] Matthias Lamping (2012), Shackles for Bees? The ECJ's Judgment on GMO-Contaminated Honey. *European Journal of Risk Regulation* 3(1): 123-129, p. 127-128.
[168] Kai Purnhagen & Justus Wesseler (2016), *The 'Honey' Judgment Bablok and Others vs. Freistaat Bayern of the Court of Justice of the European Union: Implications for Coexistence*. In Nick Kalaitzandonakes, Peter Phillips, Stuart Smyth & Justus Wesseler (Eds.), *The Coexistence of Genetically Modified, Organic and Conventional Foods: Government Policies and Market Practices*. Springer.
[169] Ibid.

president said in 2003, for example, that the nation would 'rather starve' than accept GM corn (food aid from the US).[170] There was concern that the corn seed could contaminate the entire seed supply in the country and then Zambia wouldn't be able to export products to the EU. Similar events happened in other African nations.[171]

The US, Canada, and Argentina won the trade dispute against the EU.[172] This positive ruling has done little to change the regulation of GMOs in the EU, however. The US had requested that the EU speed up the approval process for new and pending GMO authorizations, address the EU's 'zero-tolerance' policy, and challenge EU member state bans on GMOs.[173] The EU Commission approved fifteen varieties of GMOs for sale in the EU from 2004 to 2008, despite member state opposition, and some EU countries, such as Spain, began growing GM crops.[174] Despite being approved for use in food and feed, they are mostly used only for feed.[175] The European Food Safety Authority (EFSA) also published positive assessments for other GM varieties.[176]

'Legal victories, of course, do not mean commercial ones.'[177] Even though the Commission approved the production and sale of various GM crops and products, they are still not accepted by consumers and therefore only minimally present on the market.[178] Additionally, EU member states are still allowed to reject the Commission's approvals and implement national bans against GMOs.[179]

Due to pressure from member states, the Commission has asked EFSA to 'address more explicitly potential long-term effects and bio-diversity issues in their risk assessments

[170] Drezner, above n. 162, p. 169.
[171] Ibid., p. 169.
[172] Panel Report, EC – Approval and Marketing of Biotech Products, above n. 136.
[173] Pollack & Shaffer, above n. 46, p. 225.
[174] Regulation (EC) No 1829/2003 of the European Parliament and of the Council of 22 September 2003 on genetically modified food and feed. OJ L 268, 18.10.2003; Regulation (EC) No 1830/2003 of the European Parliament and of the Council of 22 September 2003 concerning the traceability and labelling of genetically modified organisms and the traceability of food and feed products produced from genetically modified organisms and amending Directive 2001/18/1EC. OJ L 268, 18.10.2003.
[175] European Parliament, *Eight Things You Should Know About GMOs*. Accessed 27 October 2015, http://www.europarl.europa.eu/news/en/news-room/20151013STO97392/Eight-things-you-should-know-about-GMOs.
[176] EFSA, *GMO*. Accessed 11 February 2016, http://www.efsa.europa.eu/en/panels/gmo.htm.
[177] Pollack & Shaffer, above n. 46, p. 229.
[178] European Parliament, above n. 175.
[179] Pollack & Shaffer, above n. 46, p. 229.

for the placing on the market of GMOs.'[180] This causes difficulties for two reasons. First, it is difficult to assess long-term effects of GMOs, and there is much uncertainty surrounding the issue. This would make EU arguments stronger and more defensible when challenged by arguments under the SPS Agreement. Second, businesses would be discouraged from seeking GM approval in the EU due to the high costs associated with additional tests for long-term and biodiversity effects.[181] This only causes more extensive delays in GMO approvals or no further approvals on the market.

Transatlantic trade in GMOs thus remains very limited, and the EU is making it even more so. Additionally, 'if the EU combines a zero-tolerance threshold with a refusal to assess without delay and approve varieties for consumption that EFSA has found to be safe, then the EU will not only affect international trade but also seriously constrain other countries' abilities to make choices over this technology.'[182] The WTO regime, it seems, had minimal impact on the Brussels Effect.

2.4.2.2 Hormones

In 1996 the US and Canada requested a panel with the EU over its prohibition on the use of six specific hormones for growth promotion purposes in meat and meat products.[183] The panel found that the ban on imports of meat and meat products from cattle treated with hormones was inconsistent with Articles 3.1 (measures must be based on international standards, where they exist), 5.1 (measures should be based on scientific risk assessment), and 5.5 (must avoid distinctions in levels of protection) of the SPS Agreement.[184] The EU refused to comply with the WTO dispute panel's ruling of beef hormones, and the US and Canada responded with retaliatory tariffs against various European products.[185]

[180] Commission of the European Communities (2006), Report from the Commission to the Council and the European Parliament on the implementation of Regulation (EC) No 1829/2003 of the European Parliament and of the Council on genetically modified food and feed. 25.10.2006. COM (2006) 626 final.
[181] Pollack & Shaffer, above n. 46, p. 229.
[182] Ibid., p. 231.
[183] Panel Report, EC – Hormones, above n. 137.
[184] Panel Report, EC – Hormones, above n. 137, para. VIII, D.
[185] WTO (2009), *DS26: European Communities – Measures Concerning Meat and Meat Products (Hormones), Summary Page*. Accessed 11 February 2016, https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds26_e.htm.

In 2003, the EU stated that it had carried out a risk assessment and the findings indicated that the hormones posed a risk for consumers. It therefore claimed that there was no longer a reason for the retaliatory tariffs since it was now in compliance with its WTO obligations. The US argued that the new EU Directive[186] did not have any scientific basis since several studies had found no health risks from consumption of meat treated with hormones.[187] In fact, the Codex Alimentarius Commission had set standards for five of the six hormones that the EU had banned.[188]

The EU in this case shows most elements of a Brussels Effect. The EU has built the regulatory capacity that allows it to influence regulation of hormones. By banning the use of hormones in beef, it clearly applies strict standards. Beef is considered to be an inelastic product, because regulation cannot be avoided by moving the regulatory targets (i.e. consumers) to another jurisdiction. The EU's market power is not entirely clear. US exports of beef to the EU represent only a small percentage of total US beef exports.[189] 'U.S. meat exports to the EC represented less than 5 percent of total American meat exports, which were worth approximately 1.3 billion dollars in 1988, 90 percent of which went to Japan (Total annual American beef production amounts to 20 billion dollars).'[190] However, over 90 percent of European Union beef imports were from Brazil, Argentina, and Uruguay, among other nations.[191]

In addition to the US and Canada, hormones are approved for use in Australia, New Zealand, South Africa, and Japan; so it seems that there are possibilities to divert trade elsewhere. On the other hand, other major markets, such as Russia and China, have also banned hormones in beef.[192] Beef is somewhat a divisible product—it is possible to treat some cattle with and others without hormones. The products then have to remain

[186] Directive 2003/74/EC of the European Parliament and of the Council of 22 September 2003 amending Council Directive 96/22/EC concerning the prohibition on the use in stockfarming of certain substances having a hormonal or thyrostatic action and of beta-agonists. OJ L 262/17. 14.10.2003.

[187] Renee Johnson (2015), *The U.S.–EU Beef Hormone Dispute*. Congressional Research Service.

[188] According to Article 3.1 of the SPS Agreement, WTO members shall base their measures on international standards unless there is a scientific justification to do otherwise. Codex did not set any limits for the three natural hormones, and set limits for residues of two of the three synthetic hormones.

[189] U.S. Meat Export Federation, *Total U.S. Beef Exports 2004-2013 (Including Variety Meat)*, https://www.usmef.org/downloads/Beef-2004-to-2013.pdf; U.S. Meat Export Federation (2013), *Leading Markets for U.S. Beef Exports. January-December 2013*, https://www.usmef.org/downloads/statistics/2013-12-beef-exports.pdf.

[190] Vogel, above n. 16, p. 169.

[191] Johnson, above n. 187.

[192] U.S. Meat Export Federation, *Australia Government Issues Advisory on China's Hormone Ban*. Accessed 14 October 2015, https://www.usmef.org/australian-government-issues-advisory-on-chinas-hormone-ban/.

segregated throughout processing and distribution. It is also sometimes possible to perform tests to detect the presence of added hormones.[193] Slaughterhouses often found it uneconomical to process both hormone-treated and untreated beef, however, since their production runs were quite small and it was both expensive and difficult to separate the products.[194]

It has been argued that it was the pressure from citizens that convinced the EU to implement its ban on hormones. As a result of the EU ban, however, other countries such as Argentina and Uruguay have taken action to prevent the use of hormones in cattle.[195] 'The need to meet the demands of these markets has motivated Argentinian and Uruguayan beef producers to adopt production practices designed to allay international concerns about animal disease and residual growth hormones in beef.'[196] Uruguay banned growth hormones in 1978 and Argentina in 2004.[197]

The US has also started a program called the USDA's Non-Hormone Treated Cattle (NHTC) program in which farms, ranches, feedlots and cattle management groups can apply to be audited and therefore approved as sources of non-hormone treated beef which can be exported to the EU.[198] The program's purpose is explicitly to allow exports of non-hormone treated beef to the EU.[199]

The EU refused to comply with the WTO dispute panel's ruling of beef hormones. The US and Canada responded with retaliatory tariffs against various European products. The EU was well within its rights as a WTO member to not comply and accept the retaliatory tariffs. This highlights a weakness of the WTO and the dispute settlement system.[200] It seems that the WTO in fact had little impact on the Brussels Effect.

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[193] Unless it is a hormone that is also produced naturally by the animal.

[194] Vogel, above n. 16, p. 161.

[195] Michael J. McConnell & Kenneth Matthews (2008), *Global Market Opportunities Drive Beef Production Decisions in Argentina and Uruguay*. United States Department of Agriculture (USDA).

[196] Ibid.

[197] Ibid.

[198] W.A. Wallis & United States (1984), *Foreign Policy, Its Impact on Agricultural Trade*. Washington, D.C: U.S. Dept. of State, Bureau of Public Affairs, Office of Public Communication, Editorial Division, http://babel.hathitrust.org/cgi/pt?id=umn.31951d008229029;view=1up;seq=1.

[199] USDA. *Non-Hormone Treated Cattle Program*, https://www.ams.usda.gov/services/imports-exports/nhtc.

[200] William A. Kerr & Jill E. Hobbs (2005), *Consumers, Cows and Carousels: Why the Dispute over Beef Hormones is Far More Important than its Commercial Value*. In Nicholas Perdikis & Robert Read (Eds.), *The WTO and the Regulation of International Trade: Recent Trade Disputes Between the European Union and the United States*. Edward Elgar Publishing, p. 192.

2.4.2.3 Dolphin-Tuna

In the Eastern Tropical Pacific (ETP) Ocean schools of yellowfin tuna typically swim underneath schools of dolphin. When tuna is fished with purse seine nets, dolphins may be trapped in the nets as well, and they often die unless they are released. The US Marine Mammal Protection Act (MMPA)[201] established requirements for tuna fishing. The MMPA prohibited the 'taking' (hunting, killing, capture) of marine mammals, including dolphins.[202] Fisherman in many places around the world used purse seine nets as a means to catch tuna.[203] The US placed restrictions on the number of dolphins that could be killed in the catching of tuna.[204] Due to the high incidence of dolphin deaths, the US banned many imports of tuna from these places.[205] The US also placed a ban on imports from 'intermediate' nations who processed tuna from fishing nations with a high dolphin mortality rate.[206]

Mexico requested a panel in 1991 against the US ban.[207] The panel found that the US could only apply regulations on the quality or content of imported tuna, but not on the way it was produced (product vs. process issue).[208] The focus of the panel was on whether the measure was consistent with the GATT, and not whether the policy was environmentally correct.[209] The ban was considered an extra-territorial application of the MMPA.[210] All GATT members, including the thirty-five member GATT Council, supported the panel's decision and not the US.[211]

In 2008, Mexico challenged the US' use of a 'dolphin-safe' label on tuna products.[212] Mexico argued that the measure was discriminatory and unnecessary under the GATT

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[201] Marine Mammal Protection Act (MMPA), October 21, 1972.

[202] Ibid., section 103.

[203] FAO, Fisheries and Aquaculture Department, *Tuna Purse-Seining*, http://www.fao.org/fishery/fishtech/40/en.

[204] MMPA, above n. 201, section 302.

[205] Ibid., section 101(a)(2).

[206] Ibid., section 101(a)(2)(D).

[207] WTO, *Mexico etc versus US: 'Tuna-dolphin*'. Accessed 11 February 2016, http://www.wto.org/english/tratop_e/envir_e/edis04_e.htm; a case brought by Mexico and others against the US under GATT. The case was settled outside of the GATT.

[208] Vogel, above n. 16, p. 118.

[209] WTO, above n. 207.

[210] Ibid.

[211] Vogel, above n. 16, p. 113.

[212] Panel Report, US – Tuna II (Mexico), above n. 138. The dispute concerned the following measures: 1) the *United States Code*, Title 16, Section 1385 ('Dolphin Protection Consumer Information Act'), 2) the *Code of*

and TBT Agreement.[213] The WTO ruled that the US labeling program was indeed discriminatory because tuna caught in the ETP had to meet additional criteria to qualify for the 'dolphin-safe' label.[214] The Panel recommended that the US bring its measures into conformity with the TBT Agreement.[215]

This case meets most of the requirements for a Brussels Effect. The US has the regulatory capacity to enforce its rules in the US and abroad. The requirement to use proper nets for the safety of dolphins is a strict standard. Since this is a standard that regulates a consumer market, it is also inelastic and cannot be moved to another jurisdiction. At the time of the original dispute, the US was the biggest market for canned tuna products,[216] making up over half of global tuna consumption.[217] Since then, the demand in western Europe has surpassed that of the US.[218] Canned tuna, however, is a divisible product. The US has established requirements for storing dolphin-safe and non-dolphin-safe tuna on board fishing vessels and in processing operations. Tracking and tracing along with auditing of fishing vessels is conducted.[219]

Federal Regulations, Title 50, Section 216.91 ('Dolphin-safe labeling standards') and Section 216.92 ('Dolphin-safe requirements for tuna harvested in the ETP [Eastern Tropical Pacific Ocean] by large purse seine vessels') and 3) the ruling in *Earth Island Institute v. Hogarth*, 494 F.3d 757 (9th Cir. 2007). Vogel, above n. 15, p. 106. ('The law required companies selling "dolphin-safe" tuna to be able to demonstrate that their product was caught using methods that limited dolphin deaths. It also required all other tuna to be labeled "caught with technologies that are known to kill dolphins."').

[213] Panel Report, US – Tuna II (Mexico), above n. 138, at 4.4, 4.5.

[214] National Oceanic and Atmospheric Administration (NOAA), *'Dolphin-Safe' Tuna, NOAA Tracking Program Verifies Claims*. Accessed 11 February 2016, http://www.noaa.gov/features/04_resources/tuna.html.

[215] Panel Report, US – Tuna II (Mexico), above n. 138, at 381.

[216] FAO (2004), *Analysis of the Tuna Industry*, http://www.fao.org/docrep/008/y5984e/y5984e0n.htm, figure 13B. See also http://aciar.gov.au/files/node/2148/MN028%20part%2021.pdf (EU figures) and http://aciar.gov.au/files/node/2148/MN028%20part%2022.pdf (US figures).

[217] Vogel, above n. 15.

[218] In 2008: Western Europe (76 million cases consumed), US (48 million cases consumed). Forum Fisheries Agency (2011), *Market and Industry Dynamics in the Global Tuna Supply Chain*, https://www.ffa.int/node/567.

[219] 'The DPCIA itself expressly mandates the use of written statements by captains to attest that either no purse seine net was intentionally deployed on or used to encircle dolphins during the trip in which the tuna were caught, and (in some cases) to also attest that no dolphins were killed or seriously injured in the sets or other gear deployments in which the tuna were caught. The tracking and verification system does not rely solely on certifications by fishing captains. As described elsewhere in this rule, certifications by an onboard observer or by an authorized representative of the nation participating in a qualified and authorized observer program are also used to help verify the dolphin-safe status of the harvested tuna for some fishing trips. The tracking and verification system also includes recordkeeping and inspections at processing facilities and certifications by importers and exporters.'
'Regulations at 50 CFR 216.93(c)(4) and (d)(4) already require vessels to segregate non-dolphin-tuna and dolphin-safe tuna. Additionally, 50 CFR 216.93(f)(3) gives the Administrator, Southwest Region, timely access

Both the *de facto* and the *de jure* Brussels Effect can be seen in different ways in this case. Due to the threat of important restrictions and US consumer preferences, several nations adjusted their fishing procedures to meet the requirements of the MMPA. The Democratic Republic of the Congo, New Zealand, Senegal, and Spain, among others, pressed their fishing boats to comply with MMPA requirements for dolphin release procedures.[220] Bermuda, Canada, South Korea, and Nicaragua stopped using purse seine nets in the ETP.[221]

Even more importantly, Mexico changed its original stance on the issue. President Carlos Salinas de Gortari professed a 'deep love of dolphins' and announced a plan to protect them.[222] Mexico also never submitted the panel report to the GATT Council for formal option, despite pressure from other nations.[223] Lastly, in May 1992, the US, Mexico, and eight other nations, which together made up 99 percent of tuna fishing in the ETP, developed and signed an international accord to protect dolphins, which included phasing out the use of purse seine nets.[224]

It is unlikely that the Mexican President Salinas had a sudden change of heart and interest in saving dolphins. It is instead likely that that this turnaround was brought about by political and economic pressure from Mexican fishermen and/or producers as potential voters, as it became more profitable to use other, dolphin-safe fishing methods.

The EU also had a dramatic change in its views on fishing with purse seine nets. It had been an intermediate processor of tuna from countries such as Mexico, and its products were therefore banned in the US. The EU had fought this within the WTO dispute settlement system on two occasions.[225] In 1992, however, the European Parliament turned around and called for a ban on imports of tuna that were caught by methods that

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to all pertinent records and facilities to allow for audits and spot-checks on caught, landed, stored, and processed tuna. NMFS believes the current system is already working well and the increased authorities and requirements of this rule will fortify the verification program. In addition, the new observer requirements will afford NMFS an additional tool in verifying the dolphin-safe status of the harvested tuna.' (from National Oceanic and Atmospheric Administration (NOAA) (2013), *Enhanced Document Requirements to Support Use of the Dolphin Safe Label on Products*, https://www.federalregister.gov/articles/2013/07/09/2013-16508/enhanced-document-requirements-to-support-use-of-the-dolphin-safe-label-on-tuna-products)

[220] Vogel, above n. 15, p. 107.

[221] Ibid., p. 107.

[222] Economist (1991), *Divine Porpoises*, at 31.

[223] Vogel, above n. 15.

[224] Ibid., p. 116.

[225] WTO, above n. 207.

resulted in dolphin mortality.[226] This measure was not adopted by the European Council of Ministers, out of fear that action would be taken against the EU within the WTO.[227] The EU did, however, forbid ships from its own member states from using purse seine nets.[228] The EU also uses a dolphin friendly label under Council Regulation (EC) No. 882/2003.[229]

2.5 Analysis and conclusions

The hypothesis was that the Brussels Effect is greater where WTO law and law of the dominant regulator diverge. Therefore, in cases where there is no relevant WTO law, the Brussels Effect is more likely to prevail. In all the cases above, the WTO poses limits, to varying extents, on the ability of a dominant regulator to impose its standards on other countries. The hypothesis proved true when we look in the black-letter of the respective WTO rulings, but the actual effects in action were typically something different.

In the GMO case, the WTO ruled against the EU for its *de facto* restrictions on GMO approvals. The effect of the ruling was limited in practice, however, since GM products are currently minimally found on the EU market. Pollack and Shaffer described this as 'reform without change'.[230] The EU did significantly modify its legislation on GMOs since the WTO ruling.[231] It ended its moratorium on new GMO approvals and even approved seventeen GM crops between May 2004 and November 2008.[232] Despite being approved for food and feed, however, they are mostly only used for feed. There is still largely an absence of GM products on the EU food market. The EU changed its legislation so that it is justifiable under the WTO dispute settlement system but otherwise it has not had much of an effect. In the hormones case, the WTO also ruled against the EU's ban on hormones in meat. Instead of changing its laws and allowing the import of hormone-treated beef, the EU preferred to accept retaliatory tariffs imposed by the US and Canada.[233] This case expressed a limit of WTO power. The WTO solution of retaliatory

[226] Vogel, above n. 15, p. 116.
[227] Ibid., p. 116-117.
[228] Ibid., p. 116-117.
[229] Council Regulation (EC) No 882/2003 of 19 May 2003 establishing a tuna tracking and verification system. OJ L 127/1, 25.3.2003.
[230] Pollack & Shaffer, above n. 46, p. 260.
[231] Ibid., p. 260.
[232] Ibid., p. 260.
[233] Kerr & Hobbs, above n. 200, p. 192; WTO, above n. 185.

tariffs was an insufficient incentive for the EU to change its behavior. The WTO ruled against the US in the dolphin/tuna case for the extra-territorial application of US laws and for discriminating between WTO members. The US changed its laws so that they were no longer discriminatory, but still exerted its influence by requiring that exporting countries meet its standards.[234]

The WTO has settled many disputes and solved many trade issues, but nevertheless, its impact is limited in situations where 'social and regulatory approaches to technology and its risks are deeply engrained'.[235] In such situations regulatory convergence is 'significantly constrained'[236] and 'not even globalization's powerful dynamics can push states into cooperating'.[237]

The Brussels Effect was identified in all cases: both a *de facto* and a *de jure* Brussels Effect occurred. When compared with the five essential factors for a Brussels Effect as discussed by Bradford,[238] however, the dominant regulator often did not meet all of the criteria. Frequently the products were divisible. Even though not all the boxes were checked, the effect was still present. This study found that therefore not all five criteria are necessary to see the effect.

Additionally, Bradford stated that international institutions such as the WTO may place limits on the Brussels Effect, which may lead to what we call reversed harmonization. This paper found that while the WTO 'black-letter law' does place limits on the effect, WTO law *in action* does not. We hence could not find any evidence that the WTO leads to reversed harmonization or would facilitate horizontalization.

In all three cases above, it has been demonstrated that the WTO has attempted to constrain the Brussels Effect, and it ruled in such a way in the DSU system. The WTO ruling had little effect on the way the dominant regulator acted, however, and also on the end result. Essentially, the WTO tried to constrain the Brussels Effect, but had little success in doing so. It is important to keep in mind again that this effect is based only on three cases in the WTO dispute settlement system. The results cannot necessarily be extrapolated to all instances of the Brussels Effect in the SPS area, or even beyond.

[234] Vogel, above n. 15, p. 107.
[235] Pollack & Shaffer, above n. 46, p. 23.
[236] Ibid., p. 23.
[237] Drezner, above n. 162, p. 5.
[238] Bradford, above n. 1, p. 10-19.

CHAPTER 3

When life gives you lemons: The 'battle of science' on the correct interpretation of data on citrus black spot disease between the European Union and South Africa according to the SPS Agreement

Abstract[239]

According to Articles 2.2, 5.1 and 5.2 of the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement), Members need to base sanitary and phytosanitary measures (SPS measures) on scientific principles and risk assessment. These provisions have sparked analysis on issues such as how this 'risk' needs to be addressed, how 'science' needs to be interpreted, and what the relationship is between values and science. It is commonly observed that the SPS Agreement leans toward a technical approach to the determination of risk. If socio-economic concerns would be taken into account in the SPS Agreement, a leeway for Members to introduce protectionist policies would open up. We illustrate with the example of the ongoing citrus dispute between the European Union and South Africa that the technical approach can likewise be used to shield protectionist policies with an extraterritorial effect. The reason for this is the uncertainty with regards to how science needs to be interpreted in relation to the probability that a disease will be introduced. Rather than debating the options of 'socio-economic' risk and 'technical' risk only, the WTO Dispute Settlement Body should use disputes such as the one on citrus to develop a more normative approach to 'risk' in the SPS Agreement, indicating the 'probability' that is normatively required to justify SPS measures.

[239] This chapter is based on Dominique Sinopoli & Kai Purnhagen (2016), When Life Gives you Lemons: The 'Battle of Science' on the Correct Interpretation of Data on Citrus Black Spot Disease Between the European Union and South Africa According to the SPS Agreement. *Trade, Law and Development* 8(1): 29-62.

3.1 Introduction

The requirement to base sanitary and phytosanitary measures (SPS measures) on science under Article 2.2 of the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) has sparked lively scholarly debate in recent decades[240] and has been the subject of a number of WTO disputes.[241] The extensive analysis in case law and scholarly work, however, has not led to certainty regarding what evidence Members have to present to uphold an SPS measure. On the contrary, these works have left a trail of uncertainty in many respects. For instance, can data from only risk assessment[242] or from risk management as well[243] be applied? Can values and cultures also be incorporated into SPS measures?[244] What can be established as common ground, however, is that in the area of policy-making, at least in practice, a technical view of risk within the SPS context still prevails.[245] The major reason for this is, from a WTO trade law perspective, summarized by Quick and Blüthner: '[I]t will be extremely difficult to replace the "scientific" route chosen by the SPS Agreement with a new approach taking socio-economic considerations into account without opening Pandora's box and allowing WTO Members to introduce protectionist measures.'[246]

The uncertainty with regards to how science needs to be interpreted to establish a sound 'probability' in terms of the SPS Agreement can be used as a shield for bringing forward such policies that impose internal standards of a bigger trading bloc on a smaller partner. In this piece, we will go beyond the classical understanding that looks only at whether measures protect internal trade to classify them as protectionist. Instead, we will look at the often overlooked facet that these measures can also be protectionist with regards to domestic standards as they factually dominate other markets.

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[240] For a summary, see Downes, above n. 97, p. 91.

[241] WTO, above n. 77.

[242] In this vein Atik, above n. 57; Warren H. Maruyama (1998), A New Pillar of the WTO: Sound Science. *The International Lawyer* 32(3): 651-677, p. 665.

[243] Marijn P. Poortvliet, Martijn Duineveld & Kai Purnhagen (2016), Risk Communication: Performativity in Action: How Risk Communication Interacts in Risk Regulation. *European Journal of Risk Regulation* 7(1): 213-217. (Illustrating that in practice risk management and risk assessment cannot easily be distinguished as risk assessment is largely dependent on the discourses in risk management).

[244] On this point, see n. 240, p. 102-03.

[245] Jacqueline Peel (2004), Risk Regulation Under the WTO SPS Agreement: Science as an International Normative Yardstick? *Jean Monnet Working Paper No. 02/04*, p. 54.

[246] Reinhard Quick & Andreas Blüthner (1999), Has the Appellate Body Erred? An Appraisal and Criticism of the WTO Hormones Case. *Journal of International Economic Law* 2(4): 603-639, p. 639.

Section 3.2 of the article will illustrate how interpretations of the 'science' paradigm in Art. 2.2 of the SPS Agreement and the 'risk' paradigm in Art. 5.1 and 5.2 of the SPS Agreement, in case law and scholarly work, have translated into uncertainty for Members regarding which scientific evidence to take into account and how to interpret science correctly in a way to establish 'probability'. In section 3.3, using an example from EU law, we will argue that such uncertainty invites Members to behave opportunistically by using such legal gaps for their own interest. Subsequently, in section 3.4 we will illustrate this with the example of the ongoing battle between South Africa and the EU on regulations for citrus. In section 3.5, we will also show what a sensible solution to this problem, an alternative measure in compliance with Article 5.6 of the SPS Agreement, may look like. Section 3.6 of the article will conclude with a suggestion to the WTO Dispute Settlement Body to use this dispute, if it ever gets to the final stage, to provide clearer guidelines on how to interpret these provisions of the SPS Agreement.

3.2 'Science' and 'risk' according to the SPS Agreement? Illustrating the trail of uncertainty

WTO law is designed to enable free trade among its Member States. However, according to the SPS Agreement, Members are allowed to establish SPS measures that affect trade if necessary for the protection of life or health. SPS measures have become more important stumbling blocks in international trade than tariffs and quantitative restrictions.[247] As the European Commission acknowledges, '[i]n today's transatlantic trade relationship, the most significant trade barrier is not the tariff paid at the customs, but so called "behind-the-border" obstacles to trade, such as different safety or environmental standards for cars.'[248]

It might be for this reason that WTO law lays down relatively strict requirements for SPS measures. In practice, the rationalization approach taken by WTO SPS law has been a major reason for disputes among the Member States. SPS law requires SPS measures to be 'based on scientific principles' and 'not maintained without sufficient scientific evidence' (Art. 2.2 of the SPS Agreement). Furthermore, they need to be 'based on an assessment (…) of the risk (…)' (Art. 5.1 of the SPS Agreement), where Members need to 'take into account available scientific evidence' (Art. 5.2 of the SPS Agreement). Paragraph 4 of Annex A of the SPS Agreement defines further requirements of risk

[247] Henson & Loader, above n. 58, p. 85.

[248] European Commission, above n. 52.

assessment without embarking on the method that is to be used.[249] In several cases, the Appellate Body (AB) has provided a bit more flesh on the bones by providing some normative requirements for risk assessment according to WTO SPS law. Risk assessment needs to be 'characterised by systematic, disciplined and objective inquiry'[250], which must build on 'legitimate science according to the rationale of the relevant scientific community'.[251] With regards to whether an SPS measure can be upheld to prevent the spreading of a disease, the AB determined that risk assessment has to establish the likelihood or probability (not merely the possibility) that the pest or disease will spread without the measure[252], followed by a thorough evaluation of this probability or likelihood.[253] It remained silent, however, with regards to whether the probability must be a certain value to justify an SPS measure, and if so, what that may be. Beyond that WTO law has mainly told us what does not constitute a benchmark. The science on which the measure is based does not need to represent the mainstream opinion in the scientific community;[254] it does not need to reflect methods of international standards,[255] nor does it need to exclusively follow the list provided in Art. 5.2 of the SPS Agreement.[256] Some commentators hence conclude that the WTO regime does not subscribe 'to a purely technical approach to SPS risk';[257] others interpret these requirements as a 'sound science' approach[258] and therefore hail the benefits of such a technocratic, science-driven approach.[259] Either way, the extreme variation in the interpretation of these SPS provisions in scholarly literature illustrates the uncertainty left by SPS law with regards to its normative requirements for justifying SPS measures. From these provisions alone it is very hard, if not impossible, for Members to derive some legal certainty regarding which science is appropriate and how to interpret science to meet the exigencies of WTO law. Such leeway in the law invites Members to behave opportunistically, using the uncertainty to their advantage and designing

[249] The latter point was highlighted by Downes, above n. 97, p. 99.

[250] Appellate Body Report, *European Communities–Measures Concerning Meat and Meat Products* (EC – Hormones), WT/DS26/AB/R (16 January 1998), para. 187.

[251] Appellate Body Report, *United States–Continued Suspension of Obligations in the EC-Hormones Dispute* (US – Continued Suspension), WT/DS320/AB/R (16 October 2008), para. 591.

[252] Appellate Body Report, *Australia – Measures Affecting Importation of Salmon* (Australia – Salmon), WT/DS18/AB/R (20 October 1998), para. 123.

[253] Ibid., para. 124.

[254] Appellate Body Report, EC – Hormones, above n. 250, paras. 187, 194.

[255] Appellate Body Report, US – Continued Suspension, above n. 251, para. 685.

[256] Appellate Body Report, EC – Hormones, above n. 250, para.187.

[257] Downes, above n. 97, p. 99.

[258] Gavin Goh (2006), Tipping the Apple Cart: The Limits of Science and Law in the SPS Agreement after Japan – Apples. *Journal of World Trade* 40(4): 655-686, p. 677.

[259] Quick & Blüthner, above n. 246.

protectionist measures shielded as a 'scientific necessity'. In certain situations the existence of scientific data is not questioned, but the interpretation of these data as required by the law is rather uncertain ('battle of science').

The textbook example of such a 'battle of science' in trade law is the proceedings between France and the European Commission in the aftermath of the bovine spongiform encephalopathy (BSE) crisis.[260] After risk assessment showed uncertainty about a possible link between BSE and Creutzfeldt-Jakob disease, which affects human beings, the Commission adopted a ban prohibiting the UK from exporting beef to other Member States and third countries.[261] The ban was soon thereafter lifted due to a new interpretation of scientific evidence under the condition that the origin of the beef was traceable according to the 'date-based export scheme' (DBES). France, however, still refused to import British beef due to the health concerns expressed, especially by the French Food Standards Agency (AFSSA), which had interpreted the same data differently. The Commission compromised by allowing France to distinctively mark British beef. However, French authorities would still have to accept the marketing of British beef in France. France, however, continued to prohibit the marketing of British beef. The British Farmers' Union (NFU) hence filed an action in French courts to enforce their freedom of movement rights, which was then referred to the European Court of Justice (ECJ). The Court decided that as the DBES was a maximum-harmonization-measure France could not rely on (today's) Art. 36 of the Treaty on the Functioning of the European Union (TFEU) to prevent British beef imports.[262] It thereby circumvented the rather delicate question with regards to the normative requirements that EU law imposes on the interpretation of scientific evidence and simply decided who decides. In the absence of such a clear hierarchy in WTO law, this institutional solution would not work. Hence, in WTO law, a different solution should be found to prevent Members from using the uncertainty with regards to the interpretation of science as both a shield and a sword for their own interest.

[260] The following passage is a shortened and revised version of a passage in Kai Purnhagen (2015), The EU's Precautionary Principle in Food Law is an Information Tool! *European Business Law Review* 26(5): 903-921, p. 917-918; For further reference, see Karolina Szawlowska (2004), Risk Assessment in the European Food Safety Regulation: Who is to Decide Whose Science is Better? Commission v. France and Beyond. *German Law Journal* 5(1): 1259-1274.

[261] Commission Decision 96/239, Emergency Measures to Protect Against Bovine Spongiform Encephalopathy, 1996 O.J.(L 78)47 (EC).

[262] Case C-241/01, Nat'l Farmers' Union v. Secrétariat générale du gouvernement, 2002, E.C.R. I-9070.

3.3 The citrus dispute as a case study – How uncertainty with regards to the interpretation of science supports the extraterritorial effect of SPS measures

In the absence of such a normative solution, the uncertainty with regards to the 'science' paradigm at WTO level can be used by economically strong Members to use SPS measures in a protectionist way with regards to their domestic standards, where these domestic standards then influence standard-setting in less strong countries (section 3.3.1). Subsequently, we will illustrate with the example of the citrus dispute between South Africa and the EU how the 'science' paradigm in the SPS Agreement can be used to this end (section 3.3.2). This case was selected specifically since it is an ongoing dispute. Since this paper claims to use a case such as the citrus dispute to introduce a more normative approach to 'risk', it is important to select a case for illustration where there is still potential for the incorporation of such an approach.

3.3.1 Possibility of Members to use SPS measures to protect local markets and extraterritorialize standards and their effects

Due to varying socio-economic settings, Members aim to reach different goals with their SPS measures:

> '*First, there are significant differences in tastes, diets, income levels and perceptions...Differences in climate and in the available technology (from refrigeration through to irradiation) affect the incidence of different food safety and agricultural health hazards. Standards reflect the feasibility of implementation, which itself is influenced by legal and industry structures as well as available technical, scientific, administrative and financial resources. Some food safety risks, for example, tend to be greater in developing countries due to weaknesses in physical infrastructure (for example standards of sanitation and access to potable water) and the higher incidence of certain infectious diseases. Further, tropical or sub-tropical climatic conditions may be more conducive to the spread of certain pests and diseases that pose risks to human, animal and/or plant health*.'[263]

[263] Jaffee & Henson, above n. 58, p. 1-2.

Lenient standards allow for more exports from developing countries and are usually perceived to be better for farmers and the economy as a whole. However, stricter requirements are important for, *inter alia*, consumer safety and plant health.[264] While different SPS measures reflect different needs of the respective populations and may be implemented for legitimate reasons,[265] they can also be used as tools to impede international trade and protect domestic producers and consumers, typically through unsubstantiated requirements and unnecessary and/or costly inspections and tests.[266] While certainly not all SPS standards are protectionary regulations in disguise, it can be difficult to distinguish them from SPS measures that are justified by a legitimate goal.[267] Nevertheless, many national regulations disadvantage imports, whether intentionally or unintentionally.

The EU is often considered to have the most stringent SPS standards.[268] The proliferation of stringent SPS standards has been a major burden on many developing countries in particular since they may face constraints in implementing more stringent standards and complying with non-domestic and international requirements. Additionally, compliance with SPS measures is a prerequisite and challenge for them to access developed country markets. Products that do not comply with local regulations cannot be sold in these markets. In this way, and under certain circumstances, bigger trading blocs can use trade to impose their domestic standards on other countries, the so-called extraterritorial effect.[269]

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[264] However, there will likely always be a debate over the ALOP due to different 'conflicting interests, perceptions of risk, and estimations of what constitutes international scientific best practices regarding food safety (…) The criteria to determine whether standards are "too high" or "too low" are likely arguable'. John S. Wilson & Tsunehiro Otsuki (2003), Balancing Risk Reduction and Benefits from Trade in Setting Standards. 2020 Vision for Food, *Agriculture and the Environment*, Focus 10, Brief 6.

[265] See illustratively Robert Howse (2000), Democracy, Science, and Free Trade: Risk Regulation on Trial at the World Trade Organization. *Michigan Law Review* 98(7): 2329-2357, p. 2329, 2342 (stipulating that the ALOP determines 'citizens' preference about risk' in opposition to the scientific determination of risk itself needed to justify SPS measures).

[266] Zarrilli, above n. 62; Gerhard Erasmus (2014), *This Dispute is About More Than Black Spots on Oranges. Tralac,* https://www.tralac.org/discussions/article/6519-this-dispute-is-about-more-than-black-spots-on-oranges.html. Due to scarce resources developing countries often face difficulties in determining the ALOP in light of their socio-economic needs, see Wahidin & Purnhagen, above n. 59.

[267] Zarrilli, above n. 62.

[268] Henson & Loader, above n. 58; Y. Gebrehiwet, S. Ngqangweni & J.F. Kirsten (2007), Quantifying the Trade Effect of Sanitary and Phytosanitary Regulations of OECD Countries on South African Food Exports. *Agrekon* 46(1): 23-39.

[269] Bradford, above n. 1.

Many African countries in particular face critical challenges in exporting products to developed country markets. For several reasons, it is often difficult to comply with more stringent standards in these markets. Demand for product quality is typically lower among consumers in these countries than consumers in developed countries. This is largely due to limited awareness of food safety and quality, lack of strong consumer organizations, and due to a lack of financial capacity, being forced to tolerate lower-quality products, training and technology.[270] Producers also do not view product quality as essential when producing for the domestic market.[271] In addition, because domestic consumer expectations of product quality are much lower, national regulations are typically more lenient than international regulations. It can therefore be challenging and costly for producers to adopt better practices if they need to meet more stringent foreign or international standards for exportation. Challenges involved in improving production and quality standards to meet the requirements in import markets include improving quality assurance and management systems, monitoring, evaluation, product testing and packaging methods. This can be difficult particularly when there are weaknesses in surveillance and risk analysis systems, and inadequate testing facilities. It also requires large investments in human capital and infrastructure to improve facilities. Additionally, it is difficult to keep track of the ever-changing SPS standards and technical requirements of trading partners in other countries.[272] While an extraterritorial effect of stricter standards from other countries might hence be beneficial for the protection of health and safety in developing countries,[273] it would also have a negative impact, including a loss of export revenue, employment and income. In addition, if a consignment is rejected at the importing country's border, additional costs incurred include loss of product value and transport costs.[274] It remains to be seen, however, whether the benefits of stricter standards will outweigh their costs.

Quantitative studies so far point in the direction that the extraterritorial effect of higher standards does not outweigh the costs for African countries. For example, Otuski, Wilson and Sewadah compared the EU and Codex standards on aflatoxin levels in cereals, edible nuts, and dried and preserved fruits.[275] They found that the EU standard, in comparison

[270] John S. Wilson & Victor O. Abiola (2003), Standards and Global Trade: A Voice for Africa. *World Bank*, p. xx.
[271] Ibid.
[272] Ibid.
[273] Tsunehiro Otsuki, John S. Wilson & Mirvat Sewadeh (2001), Saving Two in a Billion: Quantifying the Trade Effect of European Food Safety Standards on African Exports. *Food Policy* 26(5): 495–514; Wilson & Otsuki, above n. 264; Wahidin & Purnhagen, above n. 59.
[274] Gebrehiwet et al., above n. 268, p. 26-27; Wilson & Otsuki, above n. 264.
[275] Otsuki et al., above n. 273.

with the Codex Alimentarius standard, would reduce the risk to public health by approximately 1.4 deaths per billion a year—and also result in a 64% decrease in African exports, amounting to a total of USD 670 million.[276] These findings suggest that it is difficult to justify trade losses based on gains in public health, although these cases cannot be generalized.[277]

In another study by Gebrehiwet et al., the trade effect of total aflatoxin levels set by five OECD countries (Ireland, Italy, Sweden, Germany and the United States) on South African food exports was measured.[278] They found that if these five countries had adopted the total aflatoxin level recommended by Codex Alimentarius, South Africa would have gained an estimated additional USD 69 million per year from food exports. These are only a couple of examples of the many studies that show the trade effect of stringent SPS standards on developing countries.[279]

In line with the economic trade rationale that underlies the WTO, such numbers should not go unnoticed. In fact, facilitating trade, whenever possible, is therefore a great instrument for improving the economic situation in developing countries such as South Africa.[280] This is particularly truer as Art. 10 of the SPS Agreement states that Members shall take the special needs of developing countries into account.

3.3.2 How the 'science' policy supports extraterritorialization of standards – A case study on the citrus dispute between South Africa and the EU

The extraterritorial effect described is supported by the 'science' policy of WTO SPS law. The uncertainty concerning the interpretation of science in a WTO context, we argue, facilitates such an extraterritorial effect of measures. We will illustrate this with the example of the citrus dispute between South Africa and the EU.

[276] Otsuki et al., above n. 273.; Wilson & Otsuki, above n. 264.

[277] Wilson & Otsuki, above n. 264.

[278] Gebrehiwet et al., above n. 268, p. 26-27.

[279] Ibid.

[280] Globalization 101, *Trade-Not-Aid*. Accessed 14 October 2015, http://www.globalization101.org/trade-not-aid/.

3.3.2.1 The citrus dispute – Background

Over the past couple of decades, South Africa and the European Union have had an ongoing debate regarding the level of risk posed by the importation of citrus fruit containing the fungus *Guignardia citricarpa* (or *Phyllosticta citricarpa*), the agent responsible for citrus black spot (CBS) disease, into the EU. CBS causes spotty lesions on the rind, thus reducing the appeal of the fruit, but does not cause internal decay and is also not dangerous for human consumption. However, severe infections can cause premature fruit drop and highly blemished fruits are unmarketable. Additionally, infected orchards require additional fungicide treatments, and once the fungus is established it is very difficult to eradicate.[281] Although almost all citrus species are susceptible to the disease, sour orange and Tahiti limes are not affected. Lemons are particularly susceptible; therefore, when the disease becomes established in a new area it usually appears first on lemons.[282]

CBS has a wide global distribution but is only known to occur in countries with a subtropical, summer rainfall climate. In addition to South Africa, it has been found in New South Wales, Australia; Argentina; Bhutan; Brazil; China; Indonesia; India; Kenya; Mozambique; Nigeria; Philippines; Swaziland; Taiwan; Uruguay; Venezuela; West Indies;[283] Zimbabwe and Zambia.[284]

CBS has never become established in any region with a Mediterranean, i.e. winter rainfall climate, including the citrus-producing areas of the Western Cape province of South Africa, southern and western Australia, Chile, Spain, Greece, Israel, Italy, Turkey

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[281] EFSA Panel on Plant Health (2014), *Scientific Opinion on the Risk of Phyllosticta citricarpa (Guidnardia citricarpa) for the EU Territory with Identification and Evaluation of Risk Reduction Options*. EFSA Journal 12(2): 3557.

[282] Kotzé, J.M. (1981), Epidemiology and Control of Citrus Black Spot in South Africa. *Plant Disease* 65(12): 945-950, p. 945; V. Hattingh et al. (2000), *Citrus Black Spot: Pest Risk Assessment Document for the Review of Current Phytosanitary Regulations Pertaining to the Export of Fresh Citrus Fruit from the Republic of South Africa to the EU*; Department of Agriculture, Forestry & Fisheries & National Agricultural Marketing Council (DAFF & NAMC) (2015), *International Trade Probe*. Issue No 55, p. 7; EFSA Panel on Plant Health (2008), *Pest Risk Assessment and Additional Evidence Provided by South Africa on Guignardia citricarpa Kiely, Citrus Black Spot Fungus – CBS[1]-Scientific Opinion of the Panel on Plant Health*. EFSA Journal 7(1); Erasmus, above n. 266; USDA APHIS Plant Protection and Quarantine (2010), *Risk Assessment of Citrus spp. Fruit as a Pathway for the Introduction of Guignardia citricarpa Kiely, the Organism that Causes Citrus Black Spot Disease*. Rev. 2.

[283] E.C. Calavan (1960), Black Spot of Citrus. *California Citrograph* 46: 22-24.

[284] Ida Paul, A.S. van Jaarsveld, L. Korsten & V. Hattingh (2005), The Potential Global Geographical Distribution of Citrus Black Spot Caused by Guignardia citricarpa (Kiely): Likelihood of Disease Establishment in the European Union. *Crop Protection* 24(4): 297-308, p. 297-298.

and California.[285] Due to these climatic differences, CBS is actually not present throughout South Africa. While it is found in many provinces, particularly in the northeast region of the country, the following provinces are known to be CBS-free: Northern Cape, Free State, Western Cape (30 magisterial districts) and Northwest (2 magisterial districts).[286]

South Africa is a major global producer and exporter of citrus fruits, including oranges, grapefruit, lemons, limes, kumquats, pummelos, soft citrus and Seville oranges.[287] These products are referred to collectively as 'citrus fruit' in this paper. In 2014, the country-wide industry exported citrus products to 119 countries. South Africa is the third largest exporter of citrus in the world, second only to Spain and China.[288]

Citrus fruit is produced all across South Africa; production in the cooler climates of the Western and Eastern Cape provinces is focused on navel oranges, soft citrus, lemons and limes, and the other warmer provinces grow primarily grapefruit and Valencia oranges.[289] The industry produces 2 million tons and exports 1.7 million tons of citrus fruit (70% of the total volume produced) annually,[290] making it a key component of South Africa's agriculture sector. More than half of the country's fresh fruit exports are citrus.[291] Of all the southern hemisphere fresh citrus exports, 85% of grapefruit, 76% of oranges, 33% of soft citrus and 26% of lemons come from South Africa.[292] It is one of the largest horticultural sectors in the country, second only to wine.[293] The export sector is dominated by large commercial producers[294] and brings in over ZAR[295] 5 billion (US$

[285] Hattingh et al., above n. 282, p. 5-6.

[286] Department of Agriculture, Forestry & Fisheries, *Regulated Areas, Pest Free Areas with Regard to Citrus Black Spot in South Africa.* Accessed 27 January 2017, http://www.daff.gov.za/daffweb3/Branches/Agricultural-Production-Health-Food-Safety/Plant-Health/National-Control-Measures/Regulated-areas.

[287] Agricultural Product Standards Act, No. 119 of 1990; International Trade Centre (2010), South Africa: A Potential Market for Agri-Food Products from Africa.

[288] ITC, *Trade Map*. Accessed 2 September 2015, http://www.trademap.org/Index.aspx.

[289] Citrus Growers' Association (2014), Annual Report.

[290]DAFF & NAMC, above n. 282, p. 7.

[291] South African Citrus Black Spot Expert Working Group (2009), *Position Document – Comments on the European Food Safety Authority's Opinion on CBS, New Information and Implications for the Pest risk Assessment,* p. 26.

[292] Ibid.

[293] DAFF & NAMC, above n. 282, p. 7.

[294] H. Vermeulen, D. Jordaan, L. Korsten & J. Kirsten (2006), Private Standards, Handling and Hygiene in Fruit Export Supply Chains: A Preliminary Evaluation of the Economic Impact of Parallel Standards. *International Association of Agricultural Economists Conference*, Gold Coast, Australia, p. 2.

[295] ZAR = South African rand.

370 million[296]) every year.[297] The industry is also a major source of employment: 60,000 people are employed year round, and during the peak season from April to September,[298] this figure rises to approximately 100,000.

The Trade, Development and Cooperation Agreement (TDCA) of 2004 between the EU and South Africa introduced a free trade area (FTA). According to GATT Art. XXIV (1), this FTA is in itself subject to the rules of the SPS Agreement. The FTA has been successful insofar as the EU has become South Africa's main trading partner. The TDCA has been beneficial to the South African citrus industry: exports increased from ZAR 1.1 billion (USD 82 million) in 2002 to ZAR 9.3 billion (USD 700 million[299]) in 2013.[300] Many South African citrus producers, however, face problems with CBS. Import restrictions on citrus fruits infected with CBS have had a significant effect. *Guignardia citricarpa*, the agent responsible for CBS, is classified by the EU as a harmful quarantine organism in Council Directive 2000/29/EC.[301] The Directive lays down the phytosanitary provisions to be met and control measures to be carried out at the place of origin and upon arrival in the EU. Decision 2014/422/E[302] adds that citrus fruit from South Africa can only be introduced into the EU if consignments are shipped with a phytosanitary certificate, stating that: 1) the citrus has been subjected to treatments against CBS, 2) inspections have been conducted and no signs of CBS have been found to be present, and 3) samples have been taken and they do not show any signs of CBS (Annex point 1). Additionally, producers must have a traceability program and citrus fruits must be visually inspected upon arrival in the EU. In case of the presence of CBS, the batch from which the sample was taken is to be refused entry into the EU or destroyed (Article 1, Annex point 2). The Decision also states: 'In case of recurring interceptions due to failing monitoring and certification procedures within the same year, the Commission will review this Decision before the sixth interception has been notified'.[303]

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[296] As of 31 October 2016 (exchange rate: 1 USD = 13.8 ZAR).

[297] South African Citrus Black Spot Expert Working Group, above n. 291, p. 26.

[298] Nicolas Rubio (2013), Uncertainty of Policy Changes in the European Union Cloud Forecast for South African Citrus Exports. *USDA Foreign Agricultural Service, GAIN report.*

[299] As of 31 October 2016 (exchange rate: 1 USD = 13.8 ZAR)

[300] DAFF & NAMC, above n. 282, p. 7.

[301] Council Directive 2000/29, on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community, Annex II pt. I § 1, 2000 O.J. (L 169) (EC).

[302] Commission Implementing Decision of 2 July 2014 2014/422, setting out measures in respect of certain citrus fruits originating in South Africa to prevent the introduction into and the dpread within the Union of *Phyllosticta citricarpa* (McAlpine) Van der Aa (notified under document C(2014) 4191), 2014 O.J. (L 196).

[303] Ibid., recital 4.

Citrus fruits infected with *Guignardia citricarpa* are therefore not allowed to be imported into the EU due to their quarantine regulations. South Africa is not the only country affected by this regulation; Argentina[304] and Brazil[305] in particular are both battling CBS and therefore face restrictions in accessing the EU market. The EU prohibits importing citrus fruit infected with CBS due to the risk it may pose to its own citrus producing countries in the Mediterranean, including Spain, Italy and Greece. This is due to its concern that a piece of infected fruit could transfer the disease to its own citrus orchards. Therefore, the EU has implemented various restrictions and bans on the importation of citrus fruit infected with CBS.

3.3.2.2 The citrus dispute – A battle of science

Since 1992, the EU and South Africa have been engaged in a debate on CBS-related technical and political issues. Bilaterals over the past two decades have not resolved these issues.[306] The debate is not on scientific facts or due to a lack of scientific information, so the precautionary principle is not relevant. It is rather on how to interpret the available scientific evidence to determine whether it is enough to justify an SPS measure. The subject of the issue is hence a 'battle of science', as described above,

[304] European Commission Health and Consumer Protection Directorate-General (2001), *Final Report of a Mission Carried Out in Argentina from 10 to 14 September 2001 in order to Evaluate the Inspection Procedures for Citrus Fruit Originating in Argentina and Exported to the European Union*. DG SANCO/4303/2001-MR final.
[305] European Commission Health and Consumer Protection Directorate-General (2000), *Final Report of a Mission Carried Out in Brazil from 3 to 6 July 2000 in order to Evaluate the Pre-Export Inspections on Citrus Fruit Originating in Brazil and Exported to the European Union*. DG(SANCO)/1180/2000-MR final.
[306] Hattingh et al., above n. 282; European Commission Health & Consumer Protection Directorate-General (2001), *Report of the Commission Working Group on Evaluation of the Pest Risk Assessment (PRA) Prepared by South Africa on Citrus Black Spot (CBS)*; Directorate Plant Health & Quality (2002), *Response from South Africa on the Report (dated 24/10/2001) of the EC Working Group (WG) Relating to the WG's Evaluation of the Pest Risk Assessment (PRA) by South Africa on Citrus Black Spot (CBS)*; European Commission Health & Consumer Protection Directorate-General (2006), *Report of the Commission Working Group on Evaluation of the Pest Risk Assessment Prepared by South Africa on Citrus Black spot (caused by Guignardia citricarpa Kiely)*; South African Citrus Black Spot Expert Working Group (2007), *Report of the South African CBS Expert Working Group on Evaluation of the Pest Risk Analysis for Citrus Black Spot (Guignardia citricarpa) on Fresh Citrus Fruit from South Africa to the European Union*; EFSA Panel on Plant Health (PLH), above n. 282; South African Citrus Black Spot Expert Working Group, above n. 291; South African Citrus Black Spot Expert Panel (2013), *Comments on: EFSA Panel on Plant Health, 2013: Draft Scientific Opinion on the Risk of Phyllosticta citricarpa (Guignardia citricarpa) for the EU Territory with Identification and Evaluation of Risk Reduction Options*; EFSA Panel on Plant Health (2015), *Statement on the Comments by Hattingh et al. (2014) on the EFSA PLH Panel (2014) Scientific Opinion on Citrus Black Spot*. EFSA Journal 13(1); among many others.

largely resulting from the fact that WTO law does not provide any guidance on how data must be interpreted.

South Africa has exported citrus to European countries since 1926,[307] even though CBS has been present in some South African citrus orchards since 1929.[308] Most South African citrus exported to Europe has, for a long time, been primarily for consumption in the northern European member states.[309] Before the harmonization of the EU phytosanitary regulations in the early 1990s, citrus fruit exports to Europe were not subject to such strict phytosanitary regulations. Citrus fruits infected with CBS were instead regulated through quality standards, which permitted a maximum of three lesions per fruit.[310] However, with the formation of what is now the EU, and therefore the customs union among many European countries, the EU became concerned about importing citrus infected with CBS due to the risk it may pose to its own citrus producing countries in the Mediterranean.

South Africa claims the EU's phytosanitary measures against citrus black spot disease are not scientifically justified and are more trade restrictive than necessary. For example, CBS has never become established in any region with a Mediterranean climate (including the Western Cape, southern Australia, western Australia, Chile, Spain, Greece, Israel, Italy, Turkey and California) and only exists in places with a subtropical, summer rainfall climate. Therefore, South Africa argues that it is not possible for CBS to become established in the citrus-producing countries of the EU due to their Mediterranean climate.[311] The use of climate matching techniques is a common way to measure the potential for the establishment of new species.[312] Paul et al. compared the climates of places around the world where CBS is currently known to be distributed, and concluded that climate is an effective barrier for CBS establishment, and that the climate 'in the vast majority of EU countries is definitely unsuitable for establishment' of CBS.[313]

[307] Hattingh et al., above n. 282, p. 1.

[308] Paul et al., above n. 284.

[309] South African Citrus Black Spot Expert Working Group, above n. 291, p. 4.

[310] Ibid., p 4.

[311] Ibid.

[312] A. Vicent (2006), Relationship between Environmental Variables and the Risk of Establishment of Guignardia citricarpa in Spain *(unpublished manuscript).*

[313] Ida Paul et al., supra note 69, p. 302-304.

Additionally, CBS is only recorded to have spread to new areas through the movement of infected propagation material[314] into areas where citrus is grown (and, as stated above, only in areas where the climate is suitable for establishment). There is not a single reported case of CBS being spread to new areas by citrus fruit.[315] This is despite the fact that large quantities of CBS-infected citrus fruits have moved into these Mediterranean climate areas for many years.[316] Additionally, timing—of the presence of spores, of inoculation and of susceptibility—is extremely important for CBS to occur. A series of consecutive steps would have to occur in order for CBS to become established. Therefore, South Africa argues that imported citrus fruit is highly unlikely to be a pathway for the establishment of CBS.[317]

The EU defends its position by arguing that there is a chance, however minimal it may be, that CBS could become established in the EU. The EFSA Panel on Plant Health conducted a risk assessment and concluded that CBS-infected fruit from South Africa poses a risk to European citrus orchards. The EU argued that '[a]lthough the probability would be low, it is believed possible that a single conidium[318] could initiate infection and disease development on individual trees and this could ultimately lead to the eventual establishment of the disease in a citrus producing area over a long period of time'.[319] Additionally, EFSA concluded that, based on climate data, release of infectious spores in EU citrus-growing areas is in most years early enough to coincide with the climatic conditions favorable for infection.[320]

In summary, based on undisputed data, South Africa argues that the EU measures are not scientifically justified and lack a technical basis. Additionally, they are more restrictive than necessary and have a negative impact on the South African citrus

[314] For example seeds and other plant material for the purpose of creating new plants

[315] USDA APHIS Plant Protection and Quarantine, above n. 282.

[316] 'Despite over 100 years of unregulated movement of citrus fruit and citrus plant material within Australia, over 50 years of unregulated movement of citrus plants and 84 years of unregulated movement of citrus fruit from CBS endemic areas to non-endemic areas in South Africa and over 20 years of large scale citrus fruit exports from CBS-endemic countries to citrus producing regions in southern Europe (with as much as 84 years of such exports with smaller volumes), CBS has not establishment in any of these areas with a Mediterranean climate'. South African Citrus Black Spot Expert Panel, above n. 306, p. 1-2. Additionally, citrus has been exported to the EU from southern Africa since 1926; Hattingh et al., above n. 282, p. 5-6; Directorate Plant Health & Quality, above n. 306; South African Citrus Black Spot Expert Panel, above n. 306, p. 102.

[317] USDA APHIS Plant Protection and Quarantine, above n. 282; South African Citrus Black Spot Expert Panel, above n. 306, p. 1-2.

[318] The non-mobile spore of a fungus.

[319] European Commission, Health & Consumer Protection Directorate-General, above n. 306.

[320] EFSA Panel on Plant Health (PLH), above n. 281.

industry. Thus, South Africa claims that the measures imposed by the EU are not in compliance with the SPS Agreement. The EU argues that its territory is free from CBS, and since there is a chance that CBS could become established in the EU from imported fruit, it does not want to take the chance.[321] One could meaningfully explain that the EU exercises its right to determine its own ALOP by proposing a zero risk strategy with regards to CBS. However, this would not cover the problem. The question here is not so much whether the zero tolerance is legal but rather whether the SPS measure to reach this policy is justified by science. To be more precise, as scientific facts are clear, both South Africa's and the EU's positions in this respect can be legitimately justified by science. There is a slight chance that CBS might spread, even if it is very unlikely. The major issue is thus: Is that enough to justify an SPS measure? Is the EU's restriction a protectionist measure in disguise? According to which standard does science need to be evaluated? What lies behind these issues is a value judgment, namely, how to interpret science. This is particularly where the science-approach of the WTO comes to its limit and normative clarity is required.

3.4 Effect of the ban on South African citrus export markets – How bigger trading blocs define the 'science only' paradigm in WTO law

In the absence of such normative clarity on the 'science only' approach, market forces rule the game. Bigger trading blocs may be tempted to use their market power to dominate regulatory standards. This carries the danger that the question of which 'science' needs to be taken into account to satisfy WTO legal requirements will not be determined by law, but by the party with the bigger market power. We will illustrate this effect, again, with the example of the South African citrus dispute with the EU.

We have already emphasized that citrus fruit has been imported from South Africa for decades, potentially carrying CBS without being noticed and without doing harm. At the beginning of 2010, several consignments of South African citrus fruit were intercepted in the EU due to CBS. As a result, the European Commission announced in 2012 that it would institute a five-interception cutoff for South African citrus fruit infected with CBS

[321] WTO Committee on Sanitary and Phytosanitary Measures (2013), *Summary of the Meeting 27-28 June 2013*, G/SPS/R/71; WTO Committee on Sanitary and Phytosanitary Measures (2014), *Summary of the Meeting 25-26 March 2014*, G/SPS/R/74; WTO Committee on Sanitary and Phytosanitary Measures (2014), *Summary of the Meeting 15 and 17 October 2014*, G/SPS/R/76.

during the 2013 season. If South Africa reached the cutoff point, the EU would implement stricter import measures, including possibly a complete ban.[322] Therefore, the South African authorities and industry members strengthened CBS risk management measures in order to cope with the EU regulations and limit future potential interceptions.[323]

Nevertheless, the number of interceptions went above and beyond the threshold. After South Africa had 35 interceptions due to CBS, on 29 November 2013, the EU closed the market to South African citrus fruit for the remainder of the year.[324] Since it was at the end of the export season,[325] the effect on exports that year was not large; however, it would have consequences for future years.

The South African Citrus Growers' Association (CGA) implemented additional measuresduring the 2014 season[326] in order to avoid a ban. In order to export to the EU, orchards must have had a 'clean record' from the 2013 export season. All orchards must also have been tested for CBS using the pre-harvest ethephon test and must have been inspected within two weeks of harvesting. It is for these reasons that 1161 orchards withdrew their export registrations for the 2014 season.[327] On 8 September 2014, after 28 interceptions during the 2014 season, South Africa voluntarily suspended exports to the EU except for citrus fruit from the Western Cape and Northern Cape provinces.[328] However, given that approximately 80% of South African citrus production is in areas where CBS occurs, this is not a viable solution for South Africa.[329] During the 2013 season, South Africa had exported 704,020 tons of citrus fruit to the EU, and in 2014 this figure dropped to 643,303.[330] Due to the challenges and uncertainty associated with the European market, South Africa is diversifying its export market. The CGA has indicated

[322] Department of Agriculture, Forestry & Fisheries (2013), *Reports of a Ban of Exports of Fresh Citrus Fruit to the European Union due to Citrus Black Spot.* Media Release.
[323] Ibid.
[324] Perishable Products Export Control Board (PPECB) (2014), *Annual Report 2013-2014*, p. 28.
[325] Citrus arrives in the EU about four weeks after it is packed in South Africa, and interceptions in the EU are concentrated in September and October every year, Jacques Claassen (2014), *Intense Lobbying to Ensure Citrus Exports.* Farmer's Weekly, http://www.farmersweekly.co.za/a1gri-business/agribusinesses/intense-lobbying-to-ensure-citrus-exports/; Rubio, above n. 298.
[326] Three out of five strikes were from one producer located in the Eastern Cape, and the product was organic lemons (confirmed by interview with a producer in the Western Cape).
[327] Claassen, above n. 325.
[328] Citrus Growers' Association (2015). *Annual Report*.
[329] Directorate Plant Health & Quality, above n. 306, p. 4.
[330] ITC, above n. 288.

that alternative markets of interest are Indonesia, Thailand, China, USA, Vietnam, Japan, South Korea, Philippines, Russia, Ukraine and India.[331] Russia has in particular become a more attractive market due to the recent sanctions on producers in the EU. In addition, in the 20 years of trade with Russia (as of 2 October 2015), not a single shipment has been rejected on phytosanitary grounds.[332] Although in 2014 South Africa was able to divert some citrus fruit to these other export markets, estimations were that they shipped 15-20% less than in 2013.[333] It is estimated that in 2014 the industry lost a total of ZAR 1 billion (USD 75 million),[334] about half in revenue and the other half in additional spraying costs.

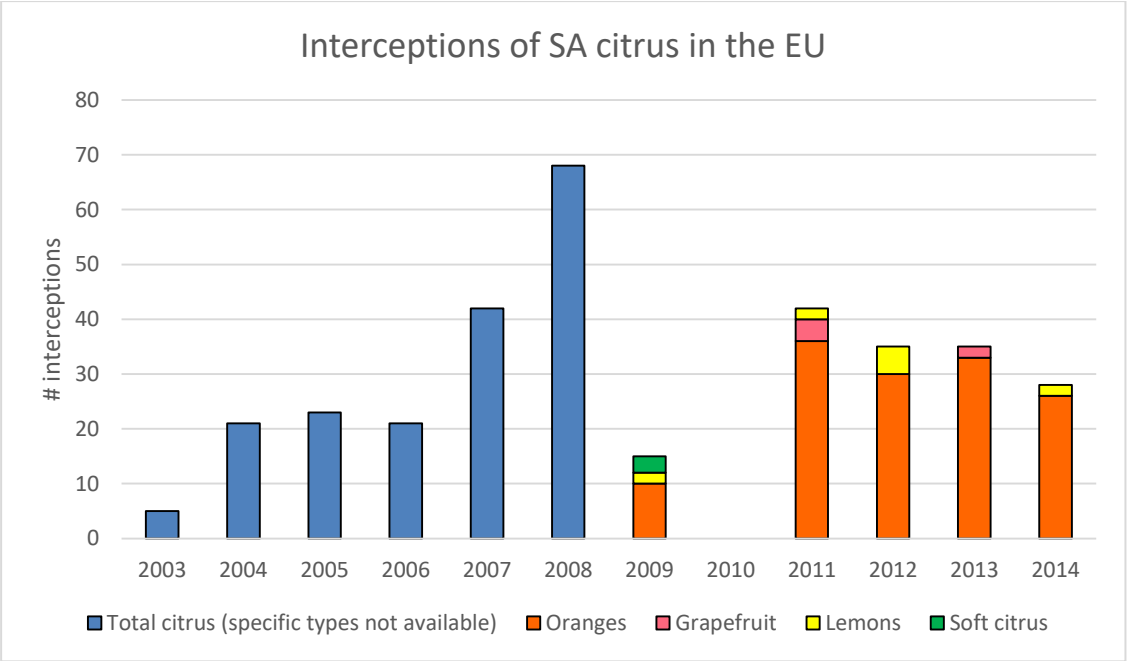

Figure 3.1. Number of interceptions of South African citrus due to CBS in the European Union from 2003-2014[335] *2010 information not available.

[331] Citrus Growers' Association, above n. 289. Citrus Growers' Association, above n. 328.

[332] Fresh Plaza (2015), *South Africa Main Citrus Supplier to Russia*, http://www.freshplaza.com/article/134982/south-africa-main-citrus-supplier-to-russia.

[333] Paul Vecchiatto (2014), SA Citrus Growers Halt Fruit Exports to EU. Investors Monthly, http://cached.newslookup.com/cached.php?ref_id=71&siteid=2060&id=8148489&t=1410151961; DAFF & NAMC, above n. 282, p. 8.

[334] As of 31 October 2016 (exchange rate: 1 USD = 13.8 ZAR)

[335] Sources of data: EUROPHYT (2011), *Interceptions of Harmful Organisms in Commodities Imported into the EU Member States and Switzerland,* http://ec.europa.eu/food/sites/food/files/plant/docs/ph_biosec_europhyt-interceptions-2011_summary.pdf; EUROPHYT (2012*), Interceptions of Harmful Organisms in Commodities Imported into the EU Member States and Switzerland,* http://ec.europa.eu/food/sites/food/files/plant/docs/ph_biosec_europhyt-interceptions-2012_summary.pdf; EUROPHYT (2013), *Interceptions of Harmful Organisms in Commodities Imported into the EU Member States and*

South Africa has criticized the lack of a harmonized inspection method in the EU. Interceptions in northern Europe, such as in Germany, the Netherlands and the UK are minimal. The majority of interceptions are in the south, particularly in Spain. It is possible that the inspections are done by visual confirmation, but spots on citrus fruit are not necessarily due to CBS, as there are numerous causes of black spots indistinguishable from CBS. South Africa is thus attempting to standardize inspection procedures.[336]

South African citrus growers and authorities have also made adjustments to comply with the EU requirements, including additional spraying, inspections, packhouse audits and testing, both in the orchard and the packhouse.[337] These measures are very costly,[338] but important to maintain access to the lucrative EU market. Nevertheless, given the uncertainty, the industry is diversifying its export markets to reduce dependence on the EU market in the long run.[339] However, 2015 brought some surprising news: South Africa was able to increase its exports to the EU, for a total of 708,856 tons.[340] The reason behind this increase is unclear. Were South Africa's increased spraying and testing effective and not insufficient as previously thought? Were the weather conditions less conducive to the growth and spread of the fungus causing CBS? Was it because South Africa focused on the northern European harbors and avoided Spain since they had previously questioned their inspection methods?

Switzerland, http://ec.europa.eu/food/sites/food/files/plant/docs/ph_biosec_europhyt-interceptions-2013_summary.pdf; EUROPHYT (2014), *Interceptions of Harmful Organisms in Commodities Imported into the EU Member States and Switzerland*, http://ec.europa.eu/food/sites/food/files/plant/docs/ph_biosec_europhyt-interceptions-2014_summary.pdf; EUROPHYT (2015*), Interceptions of Harmful Organisms in Commodities Imported into the EU Member States and Switzerland,*
http://ec.europa.eu/food/sites/food/files/plant/docs/ph_biosec_europhyt-interceptions-2015_summary.pdf; Claassen, above n. 325; EFSA Panel on Plant Health (PLH), above n. 282.

[336] South African Citrus Black Spot Expert Panel, above n. 306, p. 1-2; FreshFruitPortal.com (2015), *South Africa Alleges "Inconsistent" Citrus Inspections in Southern Europe,*
http://www.freshfruitportal.com/news/2015/02/11/south-africa-alleges-inconsistent-citrus-inspections-in-southern-europe/.

[337] DAFF & NAMC, above n. 282, p. 7; Freshfruitportal.com, above n. 336; Bureau for Food & Agricultural Policy (2014), *Baseline Agricultural Outlook 2013-2014*, p. 71.

[338] André Jooste, Erik Kruger & Flip Kotze (2003), *Standards and Trade in South Africa: Paving Pathways for Increased Market Access and Competitiveness*. In John S. Wilson & Victor O. Abiola (Eds.), *Standards and Global Trade: A Voice for Africa.* World Bank.

[339] Bureau for Food & Agricultural Policy, above n. 337, p. 71.

[340] ITC, above n. 288.

South Africa disagrees with the EU's zero tolerance approach to the presence of CBS on citrus fruit and argues it is more trade restrictive than necessary. During the whole process, South Africa tried to get help with its interpretation of data in front of international bodies. In March 2010, South Africa requested dispute resolution before the International Plant Protection Convention (IPPC).[341] Before this process could continue, both the EU and South Africa had to agree on the terms of reference and decide on three panel members. While the terms of reference have been agreed upon, there is still no consensus between the two parties regarding the panel members. This is a flaw in the system as it can stall the process for years. Even after six years, this dispute resolution has not gone one step further. In June 2013, after several years of exchanging opinions with the EU, the South African Department of Agriculture, Forest and Fisheries (DAFF) registered a trade concern with the WTO (#356).[342] Due to the limited success of the IPPC panel process and the fact that the trade concern remains unresolved, in 2014 South Africa initiated a dispute at WTO level.[343]

It is most remarkable to see that on the one hand South Africa is of the opinion that the available scientific data are not sufficient to justify a ban such as the one imposed by the EU. On the other hand, in order to not lose the important EU market, South Africa had to factually adapt to EU standards. In other words, in the absence of clear normative guidance on how to interpret the available scientific data, the EU, the bigger trading partner, *de facto* imposes its interpretation of data with regards to citrus black spot disease and the respective measures to be taken on South Africa as the smaller trading partner.

3.5 Discussion

In this section we will investigate whether WTO law can provide a solution to the problem that the 'science only' uncertainty enables stronger trading blocs to *de facto* extraterritorialize their standards. In this sense, we will analyze, again with the example of the citrus dispute, whether the SPS Agreement can, and in what way it should, provide legal certainty with regards to how the relevant data are to be interpreted. The SPS

[341] The IPPC is a treaty for international cooperation in plant protection. The IPPC is named in the SPS Agreement as an organization that develops reference standards for phytosanitary measures.
[342] WTO, *SPS Information Management System: Specific Trade Concerns*. Accessed 21 October 2015, http://spsims.wto.org/web/pages/search/stc/Search.aspx.
[343] Citrus Growers' Association, above n. 289, p. 6-7; WTO Committee on Sanitary and Phytosanitary Measures (2013), *Summary of the Meeting 27-28 June 2013*, G/SPS/R/71.

Agreement essentially applies three criteria by which a challenged SPS measure will be evaluated: there should be a scientific justification, the measure should be non-discriminatory and it should not be more trade-restrictive than necessary. Since the discrimination aspect is irrelevant in this case, the EU's measure will be analyzed according to the other two criteria.

3.5.1 Scientific justification: Probability as a benchmark under Articles 2.2 and 5.1

As discussed earlier, this case is an example of a 'battle of science' dispute. South Africa and the EU have been debating whether or not CBS can become established in the EU from infected South African citrus fruit. Their discussions focus on the technical aspects of this possibility. South Africa argues that based on scientific evidence CBS cannot become established in the EU. A whole series of consecutive, unlikely steps would need to occur for this to happen. The EU counters this by saying that the scientific evidence demonstrates that there is a small chance that CBS could become established. Since discussions between South Africa and the EU over 22 years could not settle the disagreement, the WTO will take on the role of a mediator and global regulator in this dispute. The WTO will be faced with the task of assessing the scientific validity of the EU's phytosanitary measures against the importation of South African citrus fruit due to the presence of CBS, thereby providing a benchmark against which scientific data may be evaluated in future disputes.[344]

Article 2.2 of the SPS Agreement states that SPS measures should be applied only to the extent necessary to protect human, animal or plant life or health, should be based on scientific principles and should not be maintained without sufficient scientific evidence. Exceptions are permitted in cases where Article 5.7 is relevant, which states that 'in cases where relevant scientific information is insufficient', a member may provisionally adopt SPS measures. Article 5.7 however does not apply to the citrus case because the EU's quarantine restrictions are neither provisional, nor is science inconclusive.

[344] There is ample discussion on whether the DSB's decision should be treated as such a common law of trade, see *inter alia* Raj Bhala (1999). The Myth about Stare Decisis and International Trade Law (Part One of a Triology). *American University International Law Review* 14(4): 845-946; Sinopoli & Purnhagen, above n. 13, p. 97.

The initial burden of proof to establish that the measure is not in compliance with Article 2.2 is on the complaining party, which must establish a *prima facie* case of inconsistency.[345] Afterwards, the burden of proof is on the defending party which can counter the claimed inconsistency.[346]

In a similar previous WTO dispute, *Australia – Salmon*, the Panel found that Australia's measures regarding the importation of Canadian salmon were not 'based on' a risk assessment in accordance with Article 5.1[347] and, by implication, were not in compliance with Article 2.2.[348] The Appellate Body stated that a risk assessment[349] must not simply conclude that there is a *possibility* of entry, establishment or spread of a pest or disease, but rather establish the *probability*, or likelihood, that a pest or disease will enter, establish or spread, as a result of the SPS measure that might be applied.[350] As the AB held in the earlier case on *EC – Hormones*[351], the 'risk' evaluated in a risk assessment must be an ascertainable risk; theoretical uncertainty is not the kind of risk which is to be assessed under Article 5.1.[352] The reason for this is 'since science can never provide absolute certainty that a given substance will not ever have adverse health effects',[353] theoretical uncertainty would by the end of the day allow Members to justify any kind of SPS measures. This statement can be interpreted as providing risk assessment with some, albeit weak, normative value that SPS measures need to be 'sufficiently supported or reasonably warranted by the risk assessment'.[354] However, the AB remains silent as to what 'sufficiently supported' or 'reasonably warranted' means. In *Australia – Salmon*,

[345] Panel Report, EC – Hormones, above n. 137, para. 8.252; Appellate Body Report, EC – Hormones, above n. 250, para. 98.

[346] Appellate Body Report, EC – Hormones, above n. 250, para. 98.

[347] Panel Report, *Australia – Measures Affecting Importation of Salmon* (Australia – Salmon), WT/DS18/R (12 June 1998), para 8.99.

[348] As stated in the Appellate Body Report, EC – Hormones, above n. 250: 'Articles 2.2 and 5.1 should constantly be read together. Article 2.2 informs Article 5.1: the elements that define the basic obligation set out in Article 2.2 impart meaning to Article 5.1.' Therefore, it can be presumed that if there is found to be a violation of Article 5.1 or 5.2, it can be presumed to be a violation of the more general Article 2.2. Panel Report, *India – Measures Concerning the Importation of Certain Agricultural Products* (India – Agricultural Products), WT/DS430/R, (14 October 2014), para 8.51.

[349] Appellate Body Report, Australia – Salmon, above n. 252, para. 121.

[350] Ibid., para 123. See Alessandra Arcuri (2010), Food Safety at the WTO After 'Continued Suspension': A Paradigm Shift? *Rotterdam Institute of Law and Economics (RILE)* Working Paper No. 2010/04, for an analysis of the interpretation of 'probability', p. 11.

[351] Appellate Body Report, EC – Hormones, above n. 250, paras. 187, 194.

[352] Ibid., para. 186.

[353] Ibid., para. 186.

[354] Ibid., para. 186.

the AB stipulated that paragraph 4 of Annex A of the SPS Agreement 'refers to "the evaluation of the likelihood" and not to *some* evaluation of the likelihood.'[355] One may read this passage as emphasis to provide for a substantial, qualitative or quantitative, assessment of a certain quality of the data and not just some kind of evaluation. As it is hence established that first, SPS measures require an interpretation of data and second, this interpretation needs to be of some quality, there is no certainty as to how data need to be interpreted to establish probability.

Two other similar disputes address the probability of a hazard as a benchmark in risk assessment. In *Australia – Apples*, New Zealand filed a dispute against Australia regarding Australia's measures on the importation of apples from New Zealand. Australia had adopted sixteen phytosanitary measures on the importation of New Zealand apples, including eight measures against the risk of fire blight, four against European canker, one against apple leaf-curling midge, and three regarding all of the above pests. The panel found that thirteen of the sixteen measures (the pest-specific ones) were maintained without scientific evidence and were therefore inconsistent with Article 2.2. According to the Panel, Australia's measures are 'maintained without sufficient scientific evidence'. There was no 'rational or objective' relationship between the measures and scientific evidence, and therefore they are inconsistent with Article 2.2 of the SPS Agreement.[356] Australia's measures depended on the idea that mature, symptomless apples were a pathway for the transmission of the diseases at hand. However, there was no scientific evidence that mature, symptomless apples were a pathway that would allow the introduction of these diseases from New Zealand. Additionally, there was no scientific evidence that Australia's climate was favorable for fire blight and European canker to establish and spread.[357]

Similarly, in *Japan – Apples*, the US challenged Japan's quarantine restrictions on apples from the US to protect against the introduction of fire blight. The US complained about measures on the prohibition of imported apples from orchards in which fire blight was detected, the requirement that export orchards be inspected three times a year, and the disqualification of any orchard from exporting to Japan should fire blight be detected within a 500 meter buffer zone surrounding each orchard. The Panel found that Japan's phytosanitary measures were inconsistent with Articles 2.2 and 5.1. Similar to the

[355] Appellate Body Report, Australia – Salmon, above n. 252, para. 124.

[356] Panel Report, *Australia – Measures Affecting the Importation of Apples from New Zealand* (Australia – Apples), WT/DS367/R (9 August 2010), para. 4.31.

[357] Ibid., para. 4.14.

Australia – Apples case, the United States aimed to demonstrate that mature, symptomless apples do not serve as a pathway for the entry, establishment or spread of fire blight. In order to do this, the US had to demonstrate that there was insufficient scientific evidence supporting the view that mature, symptomless apples can serve as a pathway for the disease.[358] The Panel concluded that there was indeed insufficient scientific evidence, and that there was not a 'rational relationship' between the scientific evidence available and Japan's measure.

These cases provide a benchmark for assessing the citrus dispute. As *Guignardia citricarpa* is considered to be a quarantine pest and is listed accordingly in the Directive, the EU argues that it must maintain its zero import tolerance.[359] South Africa argues that the EU's measures lack a scientific justification. Citrus has been exported to the EU since 1925, and there has never been an incidence of CBS in European orchards. Additionally, there have been no reported cases of CBS in a Mediterranean climate or of CBS becoming established through a piece of citrus fruit (instead, it is typically transferred by the movement of propagation material). The United States Department of Agriculture (USDA) also conducted an independent assessment and determined that citrus fruit is epidemiologically insignificant as a pathway for the introduction of CBS. Since CBS introduction by way of fruit depends on many specific factors at precise times, it is extremely unlikely that a piece of citrus fruit could cause the establishment of CBS.[360] Due to the very low chance that CBS could become established in the EU, South Africa argues that a zero import tolerance would be an illegal measure.[361]

South Africa's complaint regarding the EU is that the EU maintains its stringent phytosanitary measures because 'it has not been completely proven that CBS cannot establish in the PRA area'.[362] South Africa argues that this is not in accordance with the 'minimum impact' principle of the IPPC[363] and with Article 5.6 of the SPS Agreement. Additionally, South Africa argues that the EU is setting an unattainable criterion in its

[358] Panel Report, *Japan – Measures Affecting the Importation of Apples – Recourse to Article 21.5 of the DSU by the United States* (Japan – Apples), WT/DS245/RW (20 July 2005), paras. 8.85, 8.86, 8.106, WT/DS245/R (Jul. 5, 2003).

[359] European Commission, above n. 306.

[360] USDA APHIS Plant Protection and Quarantine, above n. 282.

[361] South African Citrus Black Spot Expert Working Group, above n. 306.

[362] European Commission, above n. 306; European Commission, above n. 306.

[363] IPPC (2006). ISPM 1: Phytosanitary Principles for the Protection of Plants and the Application of Phytosanitary measures in International Trade. The IPPC International Standard for Phytosanitary Measures (ISPM) No. 11 on pest risk analysis for quarantine pests recognizes that zero-risk is not a reasonable option, but rather risk management should aim to achieve only the required degree of safety that is feasible.

regulation of CBS, namely that it must be completely proven that an event cannot occur,[364] thereby applying the precautionary principle.

Taking the cases above as a benchmark, the risk assessment must establish the *probability*, or likelihood, that a pest or disease will enter, establish or spread as a result of the SPS measure. Since 1) citrus fruit has not been known to be a pathway for the establishment of CBS, 2) a series of consecutive, *unlikely* steps would need to occur for establishment, and considering that 3) CBS has never become established in a region with a Mediterranean climate, it is *unlikely* that *Guignardia citricarpa* will become established and spread in the citrus-producing countries of the EU. While the EU counters that the scientific evidence demonstrates that there is a small chance that CBS could become established in its territory, the probability is, therefore, low. Whether this suffices to establish a rational relationship between scientific evidence and the EU's measures, or to prove that these measures are sufficiently supported or reasonably warranted cannot be said with complete certainty. However, one could meaningfully argue that the low probability brings this risk assessment closer to theoretical uncertainty than ascertainable risk, the former not being accepted as justification of an SPS measure. There is therefore some argumentative support that the WTO panel would not find the EU's measures to be rational and therefore in compliance with Articles 5.1 and 2.2 of the SPS Agreement.

3.5.2 Not more trade restrictive than necessary: Alternative measures under Article 5.6

Each WTO member has the right to specify its own ALOP but is required to do so in compliance with the provisions of the SPS Agreement.[365] Members also have the right to establish SPS measures according to the ALOP they see fit; if desired, they can be as high as 'zero risk'.[366] Article 5.6 states that SPS measures should not be more trade-restrictive than required to achieve the ALOP, taking into account technical and economic feasibility. Three cumulative conditions need to be fulfilled to establish a violation of Article 5.6. The complainant needs to demonstrate that an alternative measure:

1) is reasonably available taking into account technical and economic feasibility;

[364] South African Citrus Black Spot Expert Working Group, above n. 306.

[365] Ming Du, above n. 59.

[366] SPS Agreement

2) achieves the Member's ALOP; and
3) is significantly less restrictive to trade than the SPS measure contested.

According to South Africa, the EU's measures are more trade-restrictive than required to achieve its ALOP. It is the complaining party that bears the burden of proof to establish a *prima facie* case that an alternative measure meets all three elements under Article 5.6.[367] Therefore, if South Africa wishes to challenge these measures, it must propose an alternative measure that meets the criteria above. It is then up to the EU to defend itself by arguing that the alternative measure does not meet the three criteria.

For example, this was demonstrated in *India – Agricultural Products*, in which the US requested consultations with India regarding India's prohibition of various agricultural products from the US due to concerns of avian influenza. The Panel found, and the AB upheld,[368] that India's measures were inconsistent with Articles 5.6 and 2.2 because they were significantly more trade-restrictive than required to achieve India's ALOP and were also applied beyond the extent necessary to protect human and animal life or health.[369]

When the citrus dispute is assessed at WTO level, the Panel must identify the level of protection that the EU has set as its appropriate level, and the level of protection that would be achieved by an alternative measure put forth by South Africa. If the level of protection of the proposed alternative measure meets or exceeds the EU's ALOP, it would be considered to be more trade restrictive than necessary.

While exclusion of inoculum is certainly an effective control measure, the EU's regulations on the importation of citrus from South Africa have had, and will continue to have, a profound effect on the South African citrus industry. The effects are not only felt abroad; restrictions on the importation of citrus can have a negative impact on importers and distributors in the EU. Domestic consumers are also impacted: due to the seasonality of citrus production, during its summer the EU relies on imports of citrus fruit from the southern hemisphere. For South Africa to challenge the EU's phytosanitary

[367] Appellate Body Report, *Japan – Measures Affecting Agricultural Products* (Japan – Agricultural Products II), WT/DS76/AB/R (22 February 1999), para. 126; Panel Report, India – Agricultural Products, above n. 348, para. 7.525; Appellate Body Report, *Australia – Measures Affecting the Importation of Apples from New Zealand* (Australia – Apples), WT/DS367/AB/R (29 November 2010), para. 329.
[368] Appellate Body Report, *India – Measures Concerning the Importation of Certain Agricultural Products* (India – Agricultural Products), WT/DS430/R (4 June 2015), paras. 5.227, 5.233.
[369] Panel Report, India – Agricultural Products, above n. 348, para. 7.617.

measures under Article 5.6 of the SPS Agreement, it would need to propose an alternative measure that meets the three criteria discussed above.

Under Council Directive 2000/29/E[370] the EU listed potential risk management options to deal with such situations, one of which is the establishment of a pest-free area. This would allow the importation of citrus from CBS-free provinces such as the Western Cape and Northern Cape to the EU market. Article 6.2 of the SPS Agreement also states that Members must recognize the concepts of pest-free or disease-free areas and areas of low pest or low disease prevalence. However, EFSA indicated that this is not an effective control measure in the case of South African citrus.[371] EFSA states that while in theory it would be effective, it would require continuous monitoring to ensure that the area is accurate. Although the Western Cape, Northern Cape and other regions are commonly known to be CBS-free, EFSA stated that information on such a monitoring program had not been provided to them. Nevertheless, South Africa would not benefit significantly from such a rule, as much of its citrus production does occur in places where CBS is present.

The US, on the other hand, recognizes that the Western and Northern Cape provinces are free from CBS.[372] The US currently allows the importation of citrus fruit from these provinces. Additionally, a proposed rule aims to give South African citrus even greater access to the US market. The US proposes to allow the importation of citrus fruit from areas in South Africa where CBS is known to occur. The fruit would have to be subject to phytosanitary treatment, packinghouse registration and there would have to be a traceability system in place. Additionally, a phytosanitary certificate and declaration would have to accompany the fruit. Citrus fruit from areas in South Africa that are CBS-free can continue to be imported under the current requirements, i.e. that they must be

[370] Council Directive 2000/29, above n. 301.

[371] EFSA Panel on Plant Health (PLH), above n. 282.

[372] Policies in other countries around the world:
–New Zealand: Declaration that the consignment has undergone appropriate pest control effective against *G. citricarpa* or sourced from an area free of *G. citricarpa*
–Australia: Citrus fruit may only be imported to South Australia if inspected and found free of CBS. Other states do not regulate *G. citricarpa*
–Brazil: Controls within the country regarding the spread of citrus fruit from regions with CBS to regions without CBS
–India: additional declaration required stating the fruit is free from CBS (EFSA, 2008, p. 85-86)
(South Africa's response: 'the existence of CBS regulations in other parts of the world does not automatically indicate that they are technically justified')

accompanied by a permit and subjected to inspection, shipping and packinghouse procedures.[373]

Another possibility is to set up endangered and non-endangered zones in the EU to regulate the distribution and the end use of citrus, i.e., to limit the free movement of goods and only keep South African citrus in the northern and eastern member states.[374] This measure would have the benefit of allowing South Africa to export citrus to the EU and would alleviate the concerns about the risk posed to the EU's own citrus orchards in the Mediterranean region. Additionally, it would also be beneficial for importers within the EU. However, it would, naturally, limit the idea of a European free trade area. Additionally, EFSA stated that the technical feasibility of establishing endangered and non-endangered zones is low, due to the challenges in controlling and monitoring trade between the two areas.[375] Although taking such a measure would certainly be challenging, protected zones do already exist in the EU, for example for restricting the spread of citrus tristeza virus.[376] If South Africa wishes to propose this as an alternative measure, it will be important for them to demonstrate how their exported citrus could be labeled and monitored, for example through controls and a traceability program, to avoid entering the endangered regions of the citrus-producing Mediterranean countries. They should give specific information on the actions that would be taken in order to show that it is technically feasible.

In combination with the concept of endangered zones as discussed above, it is important to limit exports of citrus fruit to the northern EU member state ports. Most South African citrus fruit consignments enter the EU through the northern member state ports, for sale in the northern member states (increasingly in the eastern member states as well). Some citrus fruit does enter through the southern member states, but is primarily distributed to the northern markets. Citrus enters through the southern member state markets for the economic benefits and convenience, although South Africa will perhaps

[373] USDA APHIS (2014), Importation of Fresh Citrus Fruit from the Republic of South Africa into the Continental United States.

[374] EFSA Panel on Plant Health (PLH), above n. 282.

[375] EFSA Panel on Plant Health (PLH), above n. 281.

[376] Directive 2000/20/EC of the European Parliament and of the Council of 16 May 2000 amending Council Directive 64/432/EEC on animal health problems affecting intra-Community trade in bovine animals and swine; Commission Directive 2001/32/EC of 8 May 2001 recognising protected zones exposed to particular plant health risks in the Community and repealing Directive 92/76/EEC; Commission Regulation (EC) No 690/2008 of 4 July 2008 recognising protected zones exposed to particular health risks in the Community (recast).

cease exports to them soon.[377] Therefore, the probability that a piece of infected fruit would come into contact with a suitable host is quite low.

There are also other potential solutions to limit the presence of CBS but which are not practical for the situation. Nevertheless, it is still worth mentioning them for the process of elimination. One option would be the use of appropriate field (chemical) treatments to eliminate or prevent the fungus. However, there is currently no treatment that has been shown to fully prevent or eliminate CBS infections.[378]Additionally, it would hypothetically be possible to restrict imports to fruit with no symptoms in the field, but inspection procedures are insufficient and symptoms can develop after harvest.[379] For this reason, EFSA suggested that South Africa apply methods to accelerate CBS symptoms to be used in a pre-entry quarantine system.[380]

Unfortunately, diverting fresh fruit to fruit intended for processing leads to a major loss of revenue since fresh fruit is worth significantly more. For example, a box of fresh oranges is worth an average of US$13.89, and the price of a box of oranges intended for processing is US$7.76. A box of fresh tangerines or mandarins is worth an average of US$23.47, but a box intended for processing is worth only US$0.75.[381]

3.6 Conclusions

Uncertainty with regards to how science has to be interpreted at WTO level to justify SPS measures provides a leeway for dominant trading blocs to impose their domestic standards on smaller trading partners. We showed with the example of the citrus black spot dispute between South Africa and the EU that due to this uncertainty, the EU was able to *de facto* export its standards to South Africa, while South Africa challenges these standards as unjustified trade barriers. The current international trading system is hence not able to provide sufficient legal certainty with regards to questions on how data must be interpreted to prevent such extraterritorial impacts.

However, if applied, WTO law indeed has the potential to provide some certainty. Drawing on previous case law (*Australia – Salmon, Australia – Apples* and *Japan – Apples*)

[377] South African Citrus Black Spot Expert Working Group, above n. 306.

[378] EFSA Panel on Plant Health (PLH), above n. 282, p. 90.

[379] Ibid.

[380] EFSA Panel on Plant Health (PLH), above n. 282.

[381] USDA APHIS Plant Protection and Quarantine, above n. 282.

we could demonstrate that current WTO SPS law has the potential to govern these disputes in a way that provides some legal guidance: an SPS measure must be based on a risk assessment that establishes the likelihood that a pest or disease will enter, establish or spread in a new territory. As discussed above, there are good arguments to support that it is unlikely that *Guignardia citricarpa* will become established and spread in the citrus-producing, Mediterranean countries of the EU, and therefore, the WTO will likely rule that the EU's measures are not in compliance with Articles 5.1 and 2.2 of the SPS Agreement. Nevertheless, the WTO needs to provide further guidance and clarification regarding how to interpret data and whether the probability that a disease may become established must be a certain value to justify an SPS measure. Since this dispute remains unresolved and similar 'battle of science' cases will likely arise in the future, it is important for the WTO to provide normative clarity on these issues.

CHAPTER 4

The potency of the SPS Agreement's 'excessivity test': The impact of Article 5.6 on trade liberalization and the regulatory power of WTO Members to take sanitary and phytosanitary measures

Abstract[382]

The article investigates the current and potential relevance of Article 5.6 SPS in deciding SPS disputes, and its impact on trade liberalization and WTO Members' power to take sanitary and phytosanitary measures. Article 5.6 of the SPS Agreement states that SPS measures may not be more trade restrictive than required to achieve a Member's appropriate level of protection. This obligation is *self-standing* and separate (in Article 5.6) from the necessity test (Article 2.2). We argue that its autonomous nature makes Article 5.6 SPS a distinct type of trade-off instrument ('excessivity test'). Using the software ATLAS.ti, we conducted a systematic content analysis of all SPS disputes invoking Article 5.6. In particular, we surveyed the jurisprudential development of the provision (outcomes of 5.6 SPS cases over time, DSB application of the three cumulative conditions and their respective outcome determinacy). Our findings show that the importance of Article 5.6 has significantly increased over time, and holds immense potential for challenges to WTO Members' domestic SPS measures for being excessively trade restrictive.

[382] This chapter was published as Hanna Schebesta & Dominique Sinopoli (2018), The Potency of the SPS Agreement's Excessivity Test: The Impact of Article 5.6 on Trade Liberalization and the Regulatory Power of WTO Members to Take Sanitary and Phytosanitary Measures. *Journal of International Economic Law* 21(1): 123-149.

4.1 Introduction

Governments pursue not only a quest for free, but also for *safe,* trading. Under the auspices of the World Trade Organisation (WTO), the search for 'the right balance'[383] between free trade and Members' rights to take domestic measures for the protection of human, animal or plant life or health is governed by the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement).[384]

As a baseline, WTO Members are allowed to take SPS measures. Consequently, free trade is regularly limited by regulations that cover very diverse issues, for example maximum residue levels for contaminants in foodstuffs, standards for food additives and import restrictions to prevent the spread of avian influenza. In the last 20 years, over 18,000 SPS measures were notified to the SPS Committee, and more than 416 specific trade concerns on food safety, plant health, and animal health regulation were flagged, in equal proportion by developing and developed countries. Of these, 36% were reported as resolved by the SPS Committee mechanism.[385]

The SPS Agreement also limits Member States' freedom to take SPS measures by imposing that they must be necessary and based on scientific principles and evidence (Article 2.2); and it contains the standard prohibition on discrimination and disguised trade restrictions (Article 2.3). Additionally, the SPS Agreement prescribes that *a domestic measure may not be more trade-restrictive than required to achieve a Member's desired level of protection* (Article 5.6). This duty is separate from the necessity test in Article 2.2. Its *autonomous* nature makes Article 5.6 SPS a distinct type of trade-off device[386] that tests whether an excessive trade restriction exists. This 'excessiveness test' mandates the trade optimization of safety regulation and enshrines a pure liberalization rationale.

This particular role of the 'excessivity test' in Article 5.6 SPS is theoretically and doctrinally understudied.[387] The article aims to analyze the current and future potency

[383] Marceau & Trachtman, above n. 60.

[384] WTO (2010), The WTO Agreements Series: Sanitary and Phytosanitary Measures, p. 27.

[385] See Committee on Sanitary and Phytosanitary Measures (2017), *Specific Trade Concerns. Note by the Secretariat*. 7 March 2017,G/SPS/GEN/204/Rev.17.

[386] Joel P. Trachtman (1998). Trade And… Problems, Cost-Benefit Analysis and Subsidiarity. *European Journal of International Law* 9: 32-85, p. 38.

[387] With the exception of Kamala Dawar & Eyal Ronen (2017). How "Necessary"? A Comparison of Legal and Economic Assessments–GATT Dispute Settlements Under: Article XX (B), TBT 2.2 And SPS 5.6. *Trade, Law and*

of Article 5.6 SPS in WTO litigation and the implications for WTO Members' regulatory powers concerning human, animal and plant life and health. To this end, we conducted a systematic analysis of the jurisprudence, evaluating all documents from the 20 disputes[388] in which Article 5.6 was cited by using qualitative content analysis software (ATLAS.ti7).[389]

In the following, we first discuss Article 5.6 and trace its recent rise in disputes (section 4.2). We then investigate how the individual Article 5.6 test conditions developed over time, examining which and how the conditions determine the outcome of Article 5.6 challenges (sections 4.3-4.5). We conclude with a modification to the interpretation of Article 5.6, and a critical evaluation of the jurisprudence in the light of trade liberalization effects and the regulatory power of WTO Members in the field of SPS (section 4.6).

4.2 Article 5.6: Testing the excessiveness of trade restrictions

We argue that the 'excessivity test' contained in Article 5.6 SPS is not a regular 'necessity test', but more trade liberalization oriented (section 4.2.1) and demonstrate that the power of the provision to challenge SPS measures has increased over time (section 4.2.2).

4.2.1 An autonomous 'excessivity test' in the SPS Agreement

The SPS Agreement elaborates on the General Agreement on Tariffs and Trade (GATT)[390] and allows Members to take SPS measures as long as they abide by its rules. SPS measures are aimed at protecting human, animal or plant life or health from risks

Development 8(1): 1-28, textbooks on the WTO and the SPS Agreement analyse the provision only curtly. Until recently, there were only few cases, as noted in 2010, '[r]egrettably, the case law relating to Article 5.6 is again very limited', see Lukasz Gruszczynski (2010), *Regulating Health and Environmental Risks under WTO Law. A Critical Analysis of the SPS Agreement*. Oxford University Press, p. 249.

[388] WTO, above n. 77.

[389] The research methodology is discussed in Hanna Schebesta (2017, forthcoming), Empirical Legal Research - Necessity, not Opportunity, *Wageningen Working Papers in Law and Governance 2017/08*, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3051163.

[390] WTO (1999), *The Legal Texts: The Results of the Uruguay Round of Multilateral Trade Negotiations*.

arising from e.g. contaminants, toxins, pests and diseases. The scope of application therefore links specific policy aims to specific types of risk.[391] An SPS measure taken in conformity with the SPS Agreement then 'shall be presumed'[392] to be in conformity with the more general GATT 1994 trade rules. This establishes the SPS regime as a *lex specialis*.

The SPS Agreement goes some way in *harmonizing* SPS measures, particularly by requiring Members to base their standards where possible on those issued by one of the three SPS-endorsed international organisations (for food safety the Codex Alimentarius Commission, for animal health and zoonoses the International Office of Epizootics (OIE), and for plant health the International Plant Protection Convention (IPPC)), unless otherwise justified by science.

In terms of the *negative integration* of trade, the SPS Agreement goes beyond the GATT in the following aspects:[393] under the GATT, Article III imposes a national treatment obligation, but recognizes the need to protect human, animal or plant life or health as an exception in Article XX(b), provided that such measures are not an arbitrary discrimination or disguised restriction on trade. Seeing the GATT as an 'incomplete contract', the SPS Agreement completes it in several respects.[394] It enshrines the standard prohibitions on discrimination and disguised restrictions (Article 2.3), but goes further than the GATT national treatment obligation:[395] SPS measures have to be necessary, consistent, and based on scientific evidence (Article 2.2). The SPS Agreement is 'not concerned with the comparability of products but with the comparability of risks'. As a result, '"like" products causing dissimilar risks (externalities) are not subject to non-discriminatory treatment and can legitimately be regulated differently under the SPS'.[396]

[391] SPS Agreement, Definition 1 of Annex A.

[392] See Article 2.4 of the SPS Agreement, which in particular singles out Article XX(b) of the GATT 1994 including (read in conjunction with footnote 1 to the preamble of the SPS Agreement) the general 'chapeau' of that provision.

[393] Boris Rigod (2013), The Purpose of the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS). *European Journal of International Law* 24(2): 503-532. In the same vein, see Trachtman, above n. 386.

[394] Ibid.

[395] Ibid.

[396] Ibid., p. 527.

Additionally, Article 5.6 obliges Members to ensure that SPS measures are not excessively restrictive to trade. Footnote 3 to Article 5.6 specifies that 'a measure is not more trade-restrictive than required unless there is another measure, reasonably available taking into account technical and economic feasibility, that achieves the appropriate level of sanitary or phytosanitary protection and is significantly less restrictive to trade.' Jurisprudence has consistently read Article 5.6 and its footnote to require a complaining WTO Member to meet a three-pronged test: the complainant must identify an alternative measure that (1) is reasonably available taking into account technical and economic feasibility; (2) achieves the Member's appropriate level of sanitary or phytosanitary protection (ALOP);[397] and (3) is significantly less restrictive to trade than the SPS measure contested.[398] The burden of proof of identifying the hypothetical alternative measure is on the complainant.[399]

The Dispute Settlement Body (DSB) has held that 'necessity is necessity', i.e. that there is no difference among the legal tests in different agreements. Dawar et al have compared the DSB's analysis and show that the economic assessment deployed in the various agreements differs.[400] Adding to this, we demonstrate that also the legal structure of the reasoning shows specificities under Article 5.6 when considering all cases that used an Article 5.6-based reasoning.

Instead of balancing the objectives pursued, the provision analyzes exclusively whether a challenged regulatory measure could be replaced by a less trade restrictive alternative regulation. The provision therefore allows WTO Members to challenge SPS measures on the basis of an excessive trade effect alone, without having to contest the scientific basis for taking a protective measure or the legitimacy of the objectives pursued. Through this mechanism, the justificatory nature of 'normal' necessity tests is lost. An inconsistency with Article 5.6 SPS results in a rebuttable presumption that the same measure is inconsistent with the obligation in Article 2.2 to ensure that an SPS measure is applied only to the extent necessary to protect human, animal or plant life or health. This does not amount to a 'consequential violation of Article 2.2'. Although 'the 'necessity'

[397] The ALOP is defined as 'The level of protection deemed appropriate by the Member establishing a sanitary or phytosanitary measure to protect human, animal or plant life within its territory', also called the 'acceptable level of risk' (Definition 4 of Annex A to the SPS Agreement).

[398] Appellate Body Report, Australia – Salmon, above n. 252, para. 194.

[399] Appellate Body Report, *Japan – Measures Affecting Agricultural Products* (Japan – Agricultural Products II), WT/DS76/AB/R (19 March 1999), para. 126. See also Panel Report, India – Agricultural Products, above n. 348, para. 7.525.

[400] See Dawar and Ronen, above n. 387.

requirement in Article 2.2 is closely linked with the determination under Article 5.6',[401] both remain different violations of the SPS Agreement. In terms of trade-off device, Article 5.6 SPS cannot be regarded as a straightforward necessity test; it is therefore specified as an 'excessivity test' hereafter.

4.2.2 Tracing the rise of Article 5.6 SPS in WTO dispute settlement

Since the WTO was established in 1995, there have been a total of 534 formal trade complaints. Of these, 47 disputes concerned the SPS Agreement, of which 20 cited Article 5.6 SPS specifically (Table 4.1).[402]

Table 4.1. Major users of the WTO dispute settlement system

Country	Respondent (all cases)	Complainant (all cases)	Respondent (SPS cases)	Complainant (SPS cases)
United States	132	115	8	12
European Union	84	97	9	5
Canada	21	37	0	9
Australia	16	7	6	0
Brazil	16	31	0	2
Argentina	22	20	0	3
Japan	15	23	3	1
South Korea	16	17	6	0
China	39	15	0	1
India	24	23	3	1
Mexico	14	24	2	3
Indonesia	14	10	3	1

There was a ruling for only 18 out of 47 SPS cases, with some cases pending and others being settled, of which 10 disputes addressed 5.6 in the report(s). This means that in just over half of the SPS cases, Article 5.6 is invoked as an independent ground for invalidating a national SPS regulation. Looking at the distribution over time, only one of the cases after 2010 has not invoked Article 5.6. This demonstrates an increasing

[401] Panel Report, *Russian Federation – Measures on the Importation of Live Pigs, Pork and Other Pig Products from the European Union* (Russia – Pigs (EU)), WT/DS475/R and Add.1 (21 March 2017).

[402] For surveying the disputes we relied on the WTO dispute database.

tendency by parties to rely on Article 5.6, and means that the provision will likely become more important in litigation practice in the future (Figure 4.1).

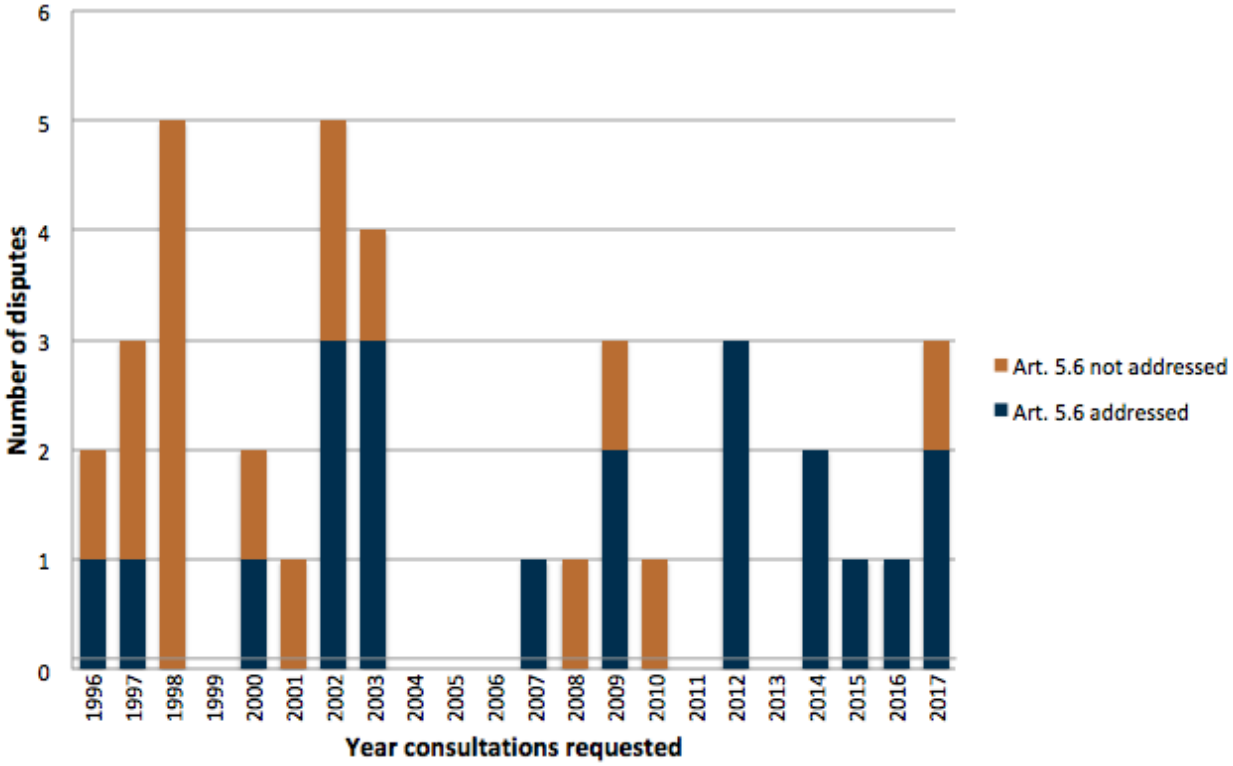

Figure 4.1. Number of disputes that requested Article 5.6 or not by year. *Number of disputes was only counted as one in cases which resulted in a joint report (i.e. GMOs, hormones, COOL).

Looking back at over 15 years of jurisprudence (the first final report of a dispute was reached in 2000), out of the ten disputes in which Article 5.6 was evaluated, only six had a final ruling on Article 5.6.[403] Out of these, an impressive share of five out of six found a violation of Article 5.6 (although, in some instances, at the level of the Compliance Panel Report). Only one single dispute resulted in a clear ruling that a domestic SPS measure did not violate the WTO rules.

[403] Out of the other three, in one (*EC – Approval and Marketing of Biotech Products*) the EU's general moratorium on GMO approvals was not considered to meet the definition of an SPS measure, so the analysis under Article 5.6 was discontinued (Panel Report, EC – Approval and Marketing of Biotech Products, above n. 136, para. 7.1405). In *Australia – Apples,* the AB found there to be insufficient information to make a finding on the level of risk associated with the proposed alternative measure. Since the AB could not compare Australia's ALOP with the level of protection of New Zealand's proposed alternative measure, it could not complete the analysis under Article 5.6 (Appellate Body Report, Australia – Apples, above n. 367, paras. 385-407). Lastly, in *US – Poultry (China),* the Panel refrained from ruling on Article 5.6 (Panel Report, *United States – Certain Measures Affecting Imports of Poultry from China* (US – Poultry (China), WT/DS392/R (25 October 2010), para. 7.337). The Panel regarded the level of risk posed by Chinese poultry products as speculative (Ibid., paras. 7.335 and 7.336).

Table 4.2. Overview of disputes in which Article 5.6 was evaluated

Dispute	Complainant	Respondent	Request for consultations received	Year panel report	Year AB report	Year Panel 21.5 report	5.6 Result
DS18: Australia – Measures Affecting Importation of Salmon	Canada	Australia	1995	1998	1998	2000	P: 5.6 violation, AB: reverse, no conclusion, CP: 5.6 violation
DS76: Japan – Measures Affecting Agricultural Products	US	Japan	1997	1998	1999		P: 5.6 violation, AB: not upheld, no violation
DS245: Japan – Measures Affecting the Importation of Apples	US	Japan	2002	2003	2003	2005	P: no conclusion, AB: no mention, CP: 5.6 violation
DS291, 292, 293: European Communities – Measures Affecting the Approval and Marketing of Biotech Products	US, Canada, Argentina	EC	2003	2006			P: no analysis
DS367: Australia – Measures Affecting the Importation of Apples from New Zealand	New Zealand	Australia	2007	2010	2010		P: 5.6 violation, AB: reverse, no conclusion
DS392: United States – Certain Measures Affecting Imports of Poultry from China	China	US	2009	2010			P: no conclusion
DS430: India – Measures Concerning the Importation of Certain Agricultural Products	US	India	2012	2014	2015		P: 5.6 violation, AB: upheld
DS447: United States – Measures Affecting the Importation of Animals, Meat and Other Animal Products from Argentina	Argentina	US	2012	2015			P: 5.6 violation
DS475: Russian Federation – Measures on the Importation of Live Pigs, Pork and Other Pig Products from the European Union	EU	Russia	2014	2016	2017		P: 5.6 violation (except Latvia), AB: 5.6 not appealed
DS484: Indonesia – Measures Concerning the Importation of Chicken Meat and Chicken Products	Brazil	Indonesia	2014	2017			P: no analysis

The data (Table 4.2) show that over time, Article 5.6 has been invoked more frequently and violations have been more consistently found, with the last three cases that were analyzed resulting in a clear violation. When considering the various rulings in different instances there are numerous reversals. The question is how this 'turbulent' pathway can be explained. In other words, what, in the application of the Article 5.6 SPS 'excessivity test', determines the finding or not of a violation?

The three prongs of the excessivity test are firmly established in jurisprudence and, as a result, are applied in a formulaic way by the DSB. However, what is actually tested, and how, in each of the elements has been subject to little systematization, a fact illustrated by diverging conclusions reached by the Panel, AB and 21.5 Compliance Panels. In the following we survey each of the elements individually, i.e. that an alternative measure is reasonable and feasible (section 4.3), that it achieves a Member's ALOP (section 4.4) and that it must be significantly less restrictive to trade (section 4.5). Lastly, we argue that the test should be extended to cover a fourth element, namely the question of whether a valid alternative measure was identified by the complainant (section 4.6).

4.3 Condition 1: An alternative that is reasonable and feasible

The first condition is that a proposed alternative SPS measure must be 'reasonably available', taking into account technical and economic feasibility.[404] It must not be merely hypothetically conceivable, but 'an option reasonably available (...) in the real world'.[405]

4.3.1 Condition 1 is often undisputed and superficially discussed

None of the 5.6 SPS disputes failed an alternative measure for not being reasonable or technically or economically feasible. This element of the test is not always disputed by the parties (i.e. in *Japan – Agricultural Products II*, *US – Animals*, *Russia – Pigs (EU)*) or subject to appeal (*Australia – Apples, India – Agricultural Products, Russia – Pigs (EU)*). It is

[404] For ease of reading, 'reasonability' should be read as referring to the joint formation of reasonability and feasibility.

[405] Panel Report, *Japan – Measures Affecting the Importation of Apples – Recourse to Article 21.5 of the DSU by the United States* (Japan – Apples), WT/DS245/RW (20 July 2005), para. 8.171.

discussed in the reports often only superficially (*Australia – Salmon*), with only a few cases going into detail (*Japan – Apples* Article 21.5 Panel Report; *India – Agricultural Products* Panel Report).

The formalistic, not to say simplistic, application of this condition is well illustrated by *Australia – Salmon*. A domestic government report on quarantine policy options mentioned that there were four options meriting consideration to govern the importation of salmon to Australia; since the alternative measures proposed were among these options, the Panel concluded that they had been treated as feasible options.[406]

In *Japan – Apples*, the proposed alternative was a restriction of exports to only mature and symptomless apples by the complainant, and therefore the economic and technical feasibility of the measure was not tested for the respondent (Japan) but for the complainant (US). The Panel quickly established the measure to be 'undeniably feasible'[407] since it was already applied under the US Apple Export Act for all US exports. The risk of *incorrect enforcement* had to be regarded as an element of feasibility.[408] In this case, the quality controls for apple fruit involved several pre-harvest and post-harvest steps and inspections carried out by federal and/or federally-licensed state inspectors 'provide[d] sufficient guarantees'[409] to ensure that indeed mature, symptomless apples would be exported. The Panel noted in passing that Japan would be free to establish additional import mechanisms to check compliance.

Only in *India – Agricultural Products* did a respondent (India) develop the argument that the proposed alternative would *not* be technically and economically easy for it to take, because it *lacked the capacity to handle resulting import volumes* and due to an *enforcement risk*.[410] The United States countered that the OIE Terrestrial Code's recommendations are developed and used around the world, indicative of their feasibility.[411] India submitted that it *lacked capacity to handle the resulting volumes of imports*, as it had quarantine facilities only at six ports and would have to increase

[406] In the subsequent Compliance Panel Report, concerning the imposition of consumer-ready salmon, it was simply argued that a regime without the consumer-ready requirements would be even more reasonably available in the sense of Article 5.6.

[407] Panel Report, Japan – Apples (Article 21.5 - US), above n. 405, para. 8.169.

[408] Ibid., para. 8.171.

[409] Ibid., paras. 8.176-8.177.

[410] Panel Report, India – Agricultural Products, above n. 348, para. 7.507.

[411] Ibid., para. 7.536.

capacity to verify the sanitary condition of each consignment of imports from notifiable avian influenza (NAI)-reporting countries. The Panel rejected the argument, because India already had a system in place that needed to respond to increases in imports that were contingent on the possibly changing NAI status of an exporting country. Additionally, the Panel rejected the idea that 'a WTO Member could justify an import ban on the basis that it is less administratively burdensome than an alternative measure'. This would 'render meaningless the requirement in Article 5.6.' India also tried to rely on *enforcement arguments*, lamenting that the Terrestrial Code shifts responsibility for the Code's application to exporting countries. India lacked resources to gather information on exporting countries' surveillance systems and establish if such systems were adequate.[412] It was further 'not prepared to put "full faith" in the United States' attestations regarding avian influenza (AI) and to import products without implementing other controls.' The Panel rejected the argument, again because India made use of exporting countries' own declarations regarding their AI-status in several different contexts.[413]

4.3.2 Findings: The reasonable availability of an alternative is readily assumed

Overall, the first condition did not emerge as a strong determinant of Article 5.6 dispute outcomes and was the least disputed by the parties. A measure was regarded as technically and economically feasible if it had been discussed as a policy option in a government report;[414] or if it was already applied by the complaining or responding member state.[415] The fact that an alternative measure is included in one of the three official SPS standard bodies was evidence of common practice[416] and technical feasibility, and confirms the importance of the international SPS-endorsed standards.[417] Overall, the case law exhibits a pronounced preference for testing 'reasonable

[412] Ibid., para. 7.508.

[413] Ibid., para. 7.541.

[414] Australia – Salmon.

[415] E.g. in Russia – Pigs (EU), the measures required by the respondent (Russia), had been applied in the past; in US – Animals, the alternative measure proposed was an already existing domestic measure (i.e. the general import rules, and a special import mitigation protocol), it was just not applied to the Argentinian regions; in Australia – Apples, New Zealand (complainant) demonstrated the practice to be part of its regular export practice by reference to its export regulations; in India – Agricultural Products, because India already accepted self-certification in other contexts.

[416] E.g. the Terrestrial Code in Russia – Pigs (EU).

[417] India – Agricultural Products.

availability' in a formal, rather than substantive, way without engaging in a concrete and factual assessment.

The 'reasonable availability' condition sees a superficial similarity between Articles XX GATT and 5.6 SPS.[418] Although technical and economic feasibility is not explicitly mentioned in the GATT, case law assessing alternative measures in the GATT context has taken such considerations into account. For example, it has been held that 'administrative difficulties'[419] did not render a measure not 'reasonably available', while impossibility to implement a measure would make it so. A measure was, however, not 'reasonably available' in the GATT where it is 'merely theoretical in nature, for instance, where the responding Member is not capable of taking it, or where the measure imposes an undue burden on that Member, such as prohibitive costs or substantial technical difficulties'.[420] By contrast, in the context of Article 5.6 SPS, reasonableness is interpreted weaker, focusing on whether it is *possible* for a Member, in an abstract sense, to take the alternative measures, and none of the disputes found a measure not to be reasonably available (see also section 4.6.2). The case law neither engaged much with the *actual capacity* of a Member to take measures as could be expected under 'feasibility'; nor did it test the reasonableness of the alternatives as a proportionality test *stricto sensu* by looking at whether it would be *reasonable* to impose the alternative measure. Both elements feature much stronger in the case law under Article XX GATT. This discrepancy may be an 'accidental' development of jurisprudence. Nevertheless, there is no convincing reason why the 'feasibility' test under SPS, a highly sensitive area, should be weaker than under the GATT.

[418] See for example, Boris Rigod (2015), *Optimal Regulation and the Law of International Trade. The Interface between the Right to Regulate and WTO Law.* Cambridge University Press, arguing that the Panel finding in Australia – Salmon and Australia – Apples are 'consistent with the AB's Article XX GATT jurisprudence on the question of whether another measure is "reasonably available"'.

[419] Panel Report, *European Communities – Measures Affecting Asbestos and Asbestos-Containing Products* (EC – Asbestos), WT/DS135/R and Add.1 (5 April 2001), para. 904.

[420] Appellate Body Report, *United States – Measures Affecting the Cross-Border Supply of Gambling and Betting Services* (US – Gambling), WT/DS285/AB/R (20 April 2005), para. 89.

4.4 Condition 2: The proposed alternative achieves the desired protection

Of the three conditions that an alternative measure must meet, the requirement to achieve the appropriate level of protection (ALOP) is the most extensively analyzed and most difficult to prove.

Point 5 of Annex A to the SPS Agreement defines the ALOP as the 'level of protection deemed appropriate by the Member establishing a sanitary or phytosanitary measure to protect human, animal or plant life or health within its territory.'[421] The ALOP is not equal to the SPS measure. Rather, the ALOP logically precedes the determination of an SPS measure;[422] the ALOP 'is an *objective*, and…[the SPS measure] is an *instrument* chosen to attain or implement that objective.'[423] The ALOP should express a threshold on the amount, intensity or extent that a Member deems to be acceptable.[424] The purpose of the analysis under Article 5.6 is *not* to determine whether the importing Member's SPS measures are based on a risk assessment,[425] and whether this risk assessment is in compliance with the SPS Agreement (as would be evaluated under Article 5.1). The legal question is whether the proposed alternative measure meets the respondent's ALOP,[426] by comparing the respondent's ALOP and the level of protection that would be achieved by the proposed alternative measure.[427] This is accomplished in three steps: i) identifying the level of protection the responding Member has set as its appropriate level, ii) determining what level of protection would be achieved by the proposed alternative measure, and iii) determining whether the level of protection that would be achieved by the alternative measure would satisfy the ALOP.[428]

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[421] SPS Agreement, Annex A, point 5. The note to this definition states that 'Many Members otherwise refer to this concept as the "acceptable level of risk".' The AB in *Australia-Apples* (see above n. 403) clarified that the two terms are equal.

[422] Appellate Body Report, Australia – Salmon, above n. 252, para. 201.

[423] Appellate Body Report, Australia – Salmon, above n. 252, para. 200.

[424] Panel Report, India – Agricultural Products, above n. 348, para. 7.562. Stating that the ALOP seeks to 'prevent ingress' was considered insufficient to meet the definition (Ibid., para. 7.565). Even if the value is not expressed in quantitative terms, it should still present an amount (Ibid., para. 7.562).

[425] Panel Report, Panel Report, *United States – Measures Affecting the Importation of Animals, Meat and Other Animal Products from Argentina* (US – Animals), WT/DS447/R (31 August 2015), para. 7.438; AB Report, Australia – Apples, above n. 367, para. 358.

[426] AB Report, Australia – Apples, above n. 367, para. 355.

[427] AB Report, India – Agricultural Products, above n. 368, para. 5.223.

[428] AB Report, Australia – Apples, para. 368.

4.4.1 Inducing the ALOP is allowed

The AB stated in *Australia – Salmon* that 'the determination of the appropriate level of protection…is a prerogative of the Member concerned and not of a panel or of the AB.'[429] A Member is entitled to establish its own ALOP, as long as it is in compliance with the provisions in the SPS Agreement.[430] Nevertheless, the subject frequently arises in disputes, as there are many situations in which a Member's ALOP is unclear and vaguely defined.

Out of the nine disputes evaluated in this study, the ALOP was clearly indicated in one, it was not evaluated due to a lack of information in three, and in the five others, it had to be inferred, to varying degrees, from the information submitted by the parties and from expert advice.

In line with in *Australia – Salmon,* Members have an obligation to identify the ALOP with sufficient precision:

(...) the SPS Agreement contains an implicit obligation to determine the appropriate level of protection. We do not believe that there is an obligation to determine the appropriate level of protection in quantitative terms. This does not mean, however, that an importing Member is free to determine its level of protection with such vagueness or equivocation that the application of the relevant provisions of the SPS Agreement, such as Article 5.6, becomes impossible. It would obviously be wrong to interpret the SPS Agreement in a way that would render nugatory entire articles or paragraphs of articles of this Agreement and allow Members to escape from their obligations under this Agreement.[431]

Therefore, the DSB is allowed to infer the ALOP in cases of insufficient precision[432] or discrepancy between what is stated and the specific facts of a case.[433] It is not 'desirable' to do so, but may be necessary.[434]

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[429] Appellate Body Report, Australia – Salmon, above n. 252, para. 199.

[430] On determining the ALOP for developing countries, see Wahidin & Purnhagen, above n. 59. Also Ming Du, above n. 59; Jeffery Atik (2012), *On the Efficiency Level of Health Measures and the "Appropriate Level of Protection*. In Geert Van Calster and Denise Prevost (Eds.), *Research Handbook on Environment, Health and the WTO*. Edward Elgar.

[431] Appellate Body Report, Australia – Salmon, above n. 252, para. 206.

[432] Ibid., para. 207.

[433] Panel Report Add.1, Russia – Pigs (EU), above n. 401, para. 85.

4.4.2 Case law shows a mostly vague definition of ALOP

In five of the surveyed cases the ALOP was vaguely defined and had to be induced by the DSB. Only one case had a clearly defined ALOP.

In *Australia – Salmon*, Australia's ALOP was not explicit, but described as 'the import prohibition on fresh, chilled or frozen salmon.'[435] The AB noted that the ALOP reflected in this import prohibition was 'undisputedly a "zero-risk level" of protection. However, Australia determined explicitly that its *appropriate* level of protection is: ... a high or "very conservative" level of sanitary protection aimed at reducing risk to "very low levels", "while not based on a zero-risk approach."'[436] The Compliance Panel found that Australia's ALOP was a 'somewhat vaguely determined level',[437] but indicated it would still carry out its task of assessing compliance under Article 5.6, and it ultimately found that Australia's measure was inconsistent with Article 5.6.[438]

In *Japan – Apples,* the ALOP was only addressed by the Compliance Panel. Japan's ALOP was described as one which 'provides a security level that will not compromise Japan's status as a fire-blight free country'[439] and 'equivalent to the one that would result from an import ban on commercial apples.'[440] The Compliance Panel concluded that mature, symptomless apples are not a pathway for the spread of fire blight, and that Japan's measure was inconsistent with Article 5.6.[441]

In *India – Agricultural Products,* India was regarded as having two ALOPs, namely the 'prevention and ingress of LPNAI and HPNAI' and 'country freedom from NAI'.[442] The Panel concluded that India's ALOP was 'very high or very conservative'.[443] However, the

[434] AB Report, India – Agricultural Products, above n. 368, para. 5.226.
[435] Appellate Body Report, Australia – Salmon, above n. 252, para. 191, cited in Australia's appellant submission, para. 311.
[436] Appellate Body Report, Australia – Salmon, above n. 252, para. 191.
[437] Panel Report, *Australia – Measures Affecting Importation of Salmon – Recourse to Article 21.5 by Canada (*Australia – Salmon 21.5 – Canada), WT/DS18/RW (18 February 2000), para. 7.129.
[438] Ibid., para. 7.153.
[439] Panel Report, Japan – Apples (Article 21.5 – US), above n. 405, para. 8.190.
[440] Ibid., para. 8.193.
[441] Ibid., para. 8.198.
[442] Panel Report, India – Agricultural Products, above n. 348, para. 7.553.
[443] Ibid., para. 7.575.

OIE's Terrestrial Code would meet this ALOP,[444] and consequently the challenged measure was ruled inconsistent with Article 5.6.[445] The AB upheld the analysis.[446]

The ALOP of the United States in *US – Animals* was between low and zero risk,[447] to prevent the introduction of foot and mouth disease (FMD) into US territory. The United States argued that the OIE's Terrestrial Code would not meet its ALOP, which is higher than that of the OIE. This is particularly for the reason that the US does not accept the OIE category of FMD-free countries or regions that practice vaccination.[448] Argentina proposed two alternative measures for the importation of fresh beef from northern Argentina. The first was the protocol outlined in the OIE's Terrestrial Code, but Argentina provided insufficient evidence that this would achieve the US ALOP.[449] The second proposed alternative was to apply the US law on protocols of fresh beef from Uruguay to northern Argentina. The alternative would meet the US ALOP, and therefore the US measure was ruled inconsistent with Article 5.6.[450] In addition, the Panel evaluated Argentina's proposed alternative for the US prohibition on imports of FMD-susceptible animals and products from Patagonia, which was to apply the protocols in existing US law.[451] The Panel found that this would also achieve the ALOP of the United States.[452]

In *Russia – Pigs (EU),* Russia argued its ALOP served to 'ensure protection (...) against the import and spread of contagious disease pathogens, including diseases common to both animals and humans, and goods which do not comply with the Common Veterinary Requirements'.[453] However, African swine fever (ASF) is present in certain regions in Russia.[454] Additionally, Russia has stated that it 'has applied a high ALOP in accordance

[444] Ibid., paras. 7.585-7.586.

[445] Ibid., para. 7.597.

[446] AB Report, India – Agricultural Products, n. 368, para. 5.227.

[447] Panel Report, US – Animals, above n. 425, para. 7.440.

[448] Ibid., para. 7.423; due to the risk of partial or no immunity in some animals and the potential for antibodies which may make it not possible to differentiate between vaccinated and infected animals.

[449] Ibid., paras. 7.500-7.504.

[450] Ibid., para. 7.511.

[451] '[A]ccurate tracking and identification of animals, effective controls on the movement of FMD-susceptible animals from regions of higher FMD risk, appropriate collection of samples and laboratory capacity, efficacious mitigating measures at slaughterhouses such as ante- and post-mortem inspections, and comprehensive control policies in case of an outbreak' (Ibid., para. 7.539).

[452] Ibid., paras. 7.546-7.548.

[453] Panel Report, Russia – Pigs (EU), above n. 401, para. 7.741.

[454] Ibid., para. 7.749.

with the provisions set out in the OIE Terrestrial Code.'[455] The Panel found that Russia's ALOP is 'high or conservative'.[456] The Panel concluded that the provisions in the OIE Terrestrial Code would meet Russia's ALOP,[457] and that Russia's EU-wide ban was inconsistent with Article 5.6.[458]

Japan's ALOP in *Japan – Agricultural Products II* is the only instance of a clearly indicated ALOP. Japan would lift the import ban if an alternative measure were equally effective. This could be measured by the level of insect mortality that could be achieved by disinfestation (i.e. complete mortality in large-scale tests on a minimum of 30,000 codling moths).[459] The alternative measure proposed by the US was testing by product (as opposed to variety), for which the Panel found there to be insufficient evidence to prove it would meet Japan's ALOP.[460] Uniquely in this dispute, the Panel deduced another alternative measure (determining the sorption level[461] of additional varieties) based on the information submitted by experts, and evaluated this in comparison with Japan's ALOP. The Panel found that this measure would achieve Japan's ALOP,[462] and since it meets all three criteria, the Panel ruled that Japan's SPS measures were inconsistent with Article 5.6.[463] The US had not argued that the determination of sorption levels is an alternative measure,[464] and the AB reversed the Panel's decision[465], 'because the United States did not establish a *prima facie* case of inconsistency with Article 5.6'.[466]

4.4.3 Findings

Condition 2 is the least predictable. The fact that in three disputes the DSB did not proceed to an evaluation suggests that a vaguely defined ALOP may help respondents to

[455] Ibid., para. 7.750.
[456] Ibid., para. 7.752.
[457] Ibid., para. 7.827.
[458] Ibid., para. 7.834.
[459] Panel Report, *Japan – Measures Affecting Agricultural Products* (Japan – Agricultural Products II), WT/DS76/R (27 October 1998), para. 8.82.
[460] Ibid., para. 8.84.
[461] Ibid., para. 8.103.
[462] Ibid., para. 8.101.
[463] Ibid., paras. 8.103-8.104.
[464] AB Report, Japan – Agricultural Products II, above n. 459, para. 130.
[465] Ibid., para. 131.
[466] Ibid., para. 130.

evade the requirement. However, where the ALOP is evaluated, all five disputes with vague/non-quantified ALOPs established an Article 5.6 violation.

The Compliance Panel in *Australia – Salmon* called for quantifiable ALOPs: '[w]e note, parenthetically, that a more explicit and in particular a quantitative expression of a Member's ALOP would greatly facilitate the consideration of compliance with not only Article 5.6 but with other provisions of the SPS Agreement as well.'[467] In the case law, we saw quantification to occur only rarely. The following types of *metrics* for achieving an ALOP can be distinguished: *quantified* expression (e.g. required mortality in disinfestation measures to provide safety as a ban); *relative* expression (e.g. by reference to an OIE standard; stating that the ALOP is higher or lower than the point of reference); *goal-based* expression (status as a pest-free country); and *categorical* expression in terms of risk classification (zero risk, low risk, conservative level). Most times, the expression of the desired ALOP remained vague, in categorical form, for example 'low risk'. Such open definitions of the acceptability of risks are in stark contrast to the scientific aspirations of the SPS Agreement.

4.5 Condition 3: How significant must the trade improvement be?

The third limb tests whether a proposed alternative measure has sufficient trade gain effects. Reflecting the WTO's trade paradigm, other benefits such as environmental or animal welfare friendliness are not included unless they can be expressed in trade. Overall, we note that the trade-restriction criterion is subject to very diverging scrutiny in different disputes. The criterion was sometimes not disputed among the parties[468] or not raised in the appeal.[469] In other cases, the DSB made a more intensive assessment[470] and failed the 5.6 test on this criterion.[471]

[467] Panel Report, Australia – Salmon (Article 21.5 – Canada), above n. 437, para. 7.129.

[468] Japan – Agricultural Products II; US – Animals.

[469] Australia – Apples; India – Agricultural Products; Russia – Pigs (EU).

[470] Notably in Australia – Salmon; Japan – Apples; Australia – Apples; India – Agricultural Products.

[471] The general measures at issue in Australia – Apples; the standard corresponding measures in Russia – Pigs (EU).

4.5.1 What is the extent of the trade improvement required?

Footnote number 3 states that a 'measure is not more trade-restrictive than required unless there is another measure [... that] is *significantly* less restrictive to trade'. Looking at the wording only, this benchmark is higher ('significantly') than under GATT. It is not clear whether the threshold for finding a measure in violation of Article 5.6 is deliberately higher. The surveyed case law does not strongly support either position. Only the Panel in *Australia - Apples* emphasized that the measure must be 'significantly' less restrictive to trade and implied that there was a difference between significantly and simply less restrictive to trade.[472] In this dispute, the Panel agreed with the defendant's submission that 'the alternative must be significantly less trade restrictive, "significant" meaning "important, notable, consequential".'[473] As the Panel findings on Article 5.6 were reversed (but this aspect was undisputed), its legal authority is questionable, demonstrating some legal uncertainty on this issue.

In fact, requiring a significant trade improvement would correspond to a *de minimis* trade restriction threshold. It is not enough that there is any kind of trade improvement, but it must surpass a certain threshold.

4.5.2 Significance by type of measure challenged and the trade improvement

There are only very few examples of proposed alternatives that failed condition 3: in *Australia — Apples*, one set of measures failed the significantly less restrictive test due to evidentiary rather than substantive concerns; in *Russia — Pigs (EU)* for only one subset of measures concerning Latvia was the proposed alternative (namely measures based on the OIE Code) not regarded as less trade restrictive, because the import ban was effectively based on that international standard.

The outcomes of the cases are most influenced by what kind of trade restriction is at issue. Based on the identified disputes, one can distinguish: *alternative measure*

[472] The Panel findings on 5.6 were ultimately reversed, but condition n. 3 was not part of the appeal; the legal weight of the Panel on this point is therefore exemplary only.
[473] Panel Report, Australia – Apples, para. VII.1261; para. VII.1264.

compared to an import ban;[474] *alternative measures compared to measures characterized as a de facto ban;*[475] and *alternative measures compared to restrictive measures*.[476]

4.5.2.1 Alternative measure compared to an import ban

It can be regarded as settled case law that 'any measure imposing conditions upon importation, even if stringent, 'would still be significantly less restrictive to trade than an outright prohibition'.[477]

In *India– Agricultural Products,* the US argued that the OIE Code standard was significantly less trade restrictive because it allows for trade with countries that report avian influenza, while India's measures did not. The Code recognizes zoning as an appropriate method to control for avian influenza risks and limits trade to the affected areas, while the challenged measures cause country-wide trade disruptions. India disputed that there would be significant increases to market access, because it would take it longer to confirm that other countries maintain adequate surveillance systems (OIE Code) than to accept imports from a country if it does not report avian influenza for three months (disputed measure).[478] The Panel did not engage with this argument and relied on the general rule that any conditions on import are by definition significantly less restrictive than an outright prohibition.

In *Russia - Pigs (EU)*, the Panel engaged in a similarly curt analysis. The Panel argumentation heavily relied on whether the disputed measures were based on the OIE

[474] Measures based on the OIE Code that identifies conditions for safe trade instead of an import prohibition of various agricultural products into India from countries reporting avian influenza (India — Agricultural Products); addition of regions to the list of FMD-free regions instead of prohibition on importation of fresh (chilled or frozen) beef from Northern Argentina and Patagonia (US – Animals); ban on non-affected EU member States as opposed to an EU-wide ban (Russia – Pigs (EU)).

[475] Quarantine policy instead of the applied measures that prohibited imports of salmon that were not heat-treated (Australia – Salmon); prohibition on apple imports unless satisfying stringent measures (Japan – Apples).

[476] Panel Report, Australia – Apples, above n. 356, para. VII.1265: Australia's measures concerning fire blight are Measures 1-8. Testing by product instead of testing by variety (undisputed among the parties, Japan – Agricultural Products II); restricting imports to mature, symptomless apples rather than very stringent pest-specific measures at issue, reduction but not elimination of trade-restrictiveness of 600-unit as opposed to 3000-unit inspection (Japan – Apples).

[477] In the Panel Report of Russia – Pigs (EU), footnotes 1158 and 1612, citing India – Agricultural Products (para. 7.590) and Australia – Salmon as authority.

[478] Panel Report, India – Agricultural Products, Add. 1, para. 13.

Code that had been put forward as the alternative measure. Since Russia's measure amounted to a ban (EU wide), while the OIE Code provides for measures for safe trade from ASF-free areas, and the EU could demonstrate that it has ASF-free areas, the disputed measures qualified as significantly restrictive to trade. An almost identical argument was accepted for non-ASF free areas, as the Code provides for measures that allow for safe trade of pig products that have been subject to treatment. Only for non-treated products from Latvia did the Russian national ban correspond to the international standard from the Code and was therefore not a less restrictive measure.

An outright ban therefore raises a presumption that any alternative measure is significantly less trade restrictive without necessitating an analysis of the actual trade effects. Consequently, in *– Animals,* the trade restriction was not even disputed between the parties. This onerous presumption was so far only rebutted where the import ban was in accordance with the international standard recognized by the SPS agreement.

4.5.2.2 Alternative measures compared to measures characterized as a de facto ban

Another way of testing trade restrictiveness is to examine whether import conditions amount to a *de facto* import ban.

In *Australia – Salmon,* the DSB considered a modified quarantine policy to an import prohibition on salmon products that were not subject to heat treatment. The alternative measures proposed would result in more salmon products being allowed on the market, in particular because there was a large demand for the product in question (e.g. salmon exceeding 450g), considering both commercial and household/consumer demand. The overall test deployed is that of *increased market access*,[479] substantiated by looking also at the *demand side* for specific types of products most severely hit by the ban. The DSB also tested the effective market foreclosure, because the Canadian product was effectively excluded from the market for whole salmon by Australia's measures. The Compliance Panel Report – despite member submissions arguing more on trade restriction – simply characterized import only of heat-treated salmon as a *de facto* ban on fresh, chilled and live salmon product. With that characterization, the trade restriction was easily regarded as significantly less.

[479] Panel Report, Australia – Salmon, above n. 347, paras. 7.150-7.152.

In *Japan – Apples*, the United States proposed to accept the exportation of 'mature symptomless apples', because this would suffice to ensure Japan's ALOP instead of the cumbersome measures imposed. The Panel examined the effect of the proposed measure on trade, considering that entire US orchards would be eligible for export that under the current measures were not. Further, the US put forward that only 1% of US orchards satisfied the current Japanese measures, while all current export by the US would qualify under the alternative measure proposed. The Panel did engage with the actual export figures and stated that since 2002 there were no apple exports from the US to Japan, despite the seemingly obvious willingness of exporters to do so. In other words, the Panel considered the *export constraints* of the proposed measures (i.e. only 1% of US orchards eligible); and *compared the export prohibitiveness* of the actual measures with the proposed alternative (i.e. burdensome measures are more export prohibitive than national measures already applied). The *actual effects* on trade patterns (no current exporting to Japan) showed that a measure *had trade effects similar to a ban* on US apples.

In the case law, the DSB has tended to look at market access tests, substantiated by looking at both the demand and supply sides.

4.5.2.3 Alternative measures compared to restrictive measures

This type of test compares measures *stricto sensu*; i.e. by looking at the intensity or number with which tests must be carried out, whether they are more costly, time-consuming, labour intensive or easier to comply with for the challenging country.

In *Australia – Apples,* the Panel[480] considered some of Australia's measures to be significantly less restrictive to trade. The Panel summarized that a market access test was used; which specifically tests whether market access would be 'obtained significantly more easily than under the current regime' and whether the market access (i.e. trade gains) would be significant. Concerning fire blight and European canker specific measures, the Panel simply stated that the 12 contested measures were significantly more trade restrictive, as they are *not just more numerous, but also more stringent and costly to comply with:*[481] More intensive inspections are more costly and

[480] The Panel Report was overturned, however, the only issues reconsidered by the AB on the fire blight and ALCM measures did not relate to condition 3. Therefore, in these parts, the Panel judgment's reasoning can be seen to be valid.

[481] Panel Report, Australia – Apples, above n. 356, para. 7.1263.

time-consuming, in particular with a five time smaller sample size; in this case the reduction would be about 600-unit as opposed to 3000-unit inspections. Also *half the fumigation rate than another measure would be significantly less trade restrictive than other measures.*[482] By contrast, concerning the other measures, i.e. inspections, operation under standard commercial practices and packing house requirements, the Panel agreed[483] that compliance with standard commercial practices would be costly and time consuming, but found that the parties provided insufficient evidence to demonstrate the increase in market access.

In terms of outcome, in *Australia – Apples* the Panel failed the challenge of general measures on grounds that the claim that alternatives would be significantly less trade restrictive was not well underscored. The other challenges passed the criterion rather easily.

4.5.3 Findings

Only exceptionally did an alternative measure not constitute a significant trade improvement. Based on the analysis, it appears that the most decisive criterion is the *nature of the restriction that is challenged*, for instance whether it concerns a complete import ban or import restrictions.

Restrictive import conditions as an alternative measure instead of an *import ban* will generally qualify as a significant trade improvement. Less restrictive conditions as an alternative to very stringent import conditions will be scrutinized by the DSB, but have a good chance to qualify as a significant trade improvement. In particular, the DSB examines whether stringent import conditions can be characterized as a *de facto* ban on imports and otherwise compares the restrictiveness of the measures at issue.

There is leeway for jurisprudential developments to make the *significance* of the trade improvement a more important issue, in case the DSB decides to attach more meaning to the 'significance' of the trade improvement. The grey area where this could be meaningful is an *India – Agricultural Products* type of situation. Assuming that quarantine surveillance or documentation would in fact take more or the same time

[482] Ibid., para. 7.1364; Australia's measure concerning ALCM is Measure 14.
[483] Ibid., 7.1398.

than an import ban that is limited in time, one could argue that the overall trade gains are not sufficiently significant.

4.6 The potency of Article 5.6 SPS

Sections 4.3-4.6 examined how the *individual elements* of the test determine an Article 5.6 violation. Based on the findings, we identify a major source of legal uncertainty in the application of Article 5.6 and suggest a doctrinal refinement of the test applied (section 4.6.1). We proceed to analyze our findings in light of trade liberalization theories: what kind of trade-off device is Article 5.6 and what kind of balance is struck between the need for domestic SPS measures and trade liberalization? (subsection 4.6.2) and examine how these interpretations affect the regulatory power of SPS measures for WTO members institutionally (subsection 4.6.3).

4.6.1 Adding a preliminary condition: Identification and validity of the alternative measure

The case overview strongly suggests that the *type* of restriction and the *type* of alternative measure proposed are highly outcome determinative. It was easiest to demonstrate a violation of Article 5.6 if the proposed alternative measure was one based on an international standard. A proposed measure based on scientific evidence was more difficult to prove and required extensive analysis from the Panels and AB and often the input of experts. Four types of alternative measures proposed by complainant countries were identified: those based on *international standards*; *existing legislation*; *science and technical solutions*; and *private measures*.

Alternative measures based on *international standards* provided the strongest presumption that an alternative fulfilled the ALOP, unless the ALOP sought was explicitly higher than that of an international standard. In *India – Agricultural Products*, the proposed and accepted alternative measures were based on the OIE's Terrestrial Code.[484] In *Russia – Pigs (EU)*, the EU proposed applying regionalization in accordance with Chapter 15.1 of the OIE's Terrestrial Code (i.e. allowing exports from disease-free countries and zones), rather than implementing an EU-wide ban.[485] The alternative met

[484] Panel Report, India – Agricultural Products, above n. 348, para. 7.526.

[485] Panel Report, Russia – Pigs (EU), above n. 401, paras. 7.809- 7.814.

the Article 5.6 requirements.[486] In *US – Animals,* Argentina proposed that the US follow the OIE's recommendations for importation of fresh meat from FMD-free countries or zones where vaccination is practiced.[487] However, the US ALOP for FMD was higher than that achieved by the OIE Terrestrial Code.[488] The Panel concluded that Argentina failed to prove that this alternative measure would meet the US's ALOP.[489] With strong evidence, international standards can deviate from a country's ALOP.

Alternatives are also commonly based on *existing legislation* that is already applied in other countries. In *US – Animals,* Argentina proposed that the US allow the mitigating protocols and addition of Patagonia to the list of FMD-free countries or regions under existing US law.[490] The Panel found that these existing US measures would meet the US ALOP.[491] By contrast, in *US – Poultry (China)*, the US enacted a measure which excluded the import of poultry products from China into the United States. China argued that an alternative measure would be the application of normal approval procedures for the importation of poultry products, i.e. the same requirements as for other WTO members.[492] In this case, the Panel found that the level of risk posed by Chinese poultry was unknown, so the analysis would be too speculative and it declined to rule on Article 5.6.[493] This confirms the problem of relying on alternative measures that would need a scientific assessment in dispute procedures.

Ad-hoc *science and technical solutions* that are not based on international or national standards may also be proposed. In *Australia – Salmon*, the alternative measures were five technical options listed in Australia's own government report, in particular evisceration.[494] In *Japan - Agricultural Products II,* the alternative measure was testing by product (vs. variety), for which the Panel found there to be insufficient evidence to prove it would meet Japan's ALOP.[495] In *Japan – Apples,* the US's proposed measure was to allow the importation of mature, symptomless apples since they are not known to be

[486] Ibid., paras. 7.816-7.834.
[487] Panel Report, US – Animals, above n. 425, para. 7.432.
[488] Ibid., para. 7.503. The US measures were not based on the Terrestrial Code precisely because the US does not consider regions recognized by the OIE as FMD-free where vaccination is practised to be FMD-free
[489] Ibid., para. 7.504.
[490] Ibid., paras. 7.432, 7.433 and 7.548.
[491] Ibid., para. 7.511.
[492] Panel Report, US – Poultry (China), above n. 403, para. 7.321.
[493] Ibid., para. 7.335.
[494] Panel Report, Australia – Salmon, above n. 347, para. 8.169.
[495] Panel Report, Japan – Agricultural Products II, above n. 459, para. 8.84.

a pathway for the transmission of fire blight,[496] similar to *Australia – Apples,* in which New Zealand proposed to restrict imports to mature and symptomless apples. This type of alternative is afflicted with the highest legal uncertainty.
Lastly, *private or public-private standard setting bodies* can take valid alternative measures to be proposed as the DSB saw no reason to reject such alternative measures *a priori*.[497] It is, however, a highly contested issue whether a pure private standard constitutes a valid alternative, and one may expect this to become a topic of future litigation.

The *type* of alternative usually makes or breaks an Article 5.6 challenge. Where the alternative measure is a technical solution, the case law showed that the DSB was more likely to not rule on an issue or to rule differently in various instances. The DSB shies away from engaging in science, inclined to find formal solutions, outsourcing scientific analysis either to one of the three endorsed international standards, or stating that the country already applies a similar measure (which then makes the argument akin to a non-discrimination argument). Alternative measures based on a standard written by one of the three SPS-endorsed standard-setting organisations (Codex, OIE, IPPC) were regularly regarded as achieving a given ALOP. This would only be different if the ALOP were explicitly defined in deviation of the international standards. The relationship between domestically taken SPS measures and international SPS standards is a key issue, and the research confirms that the application of Article 5.6 SPS reinforces the hegemony of the three endorsed SPS international standard-setting bodies. It is important to note that these standards often work on a consensus basis, but that decisions may also be taken by vote.[498] In this case, Member States' regulatory autonomy or even unilateral regulatory dominance is clearly limited by multilateral regulatory globalization.

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[496] Panel Report, Japan – Apples (Article 21.5 - US), above n. 405, para. 8.198.

[497] Panel Report, Japan – Apples (Article 21.5 – US), above n. 405. The alternative export measure was taken by private parties. The Panel underlined that the 'standards are specified in legislation and subject to control by duly licensed government inspectors', but conceded that they were 'a combination of public and private interventions.'

[498] 'In almost all cases, standards are adopted by consensus. In a small minority of cases, where it is not possible to achieve consensus, standards have been adopted after a vote. Voting is normally done by a show of hands and a two-thirds majority is sufficient for the adoption of a standard. More than half the Delegates representing Member Countries must be present in order to have a quorum for the adoption of standards'. OIE (2016), *Procedures used by the OIE to set standards and recommendations for international trade.* Accessed 13 August 2017,
http://www.oie.int/fileadmin/Home/eng/Internationa_Standard_Setting/docs/pdf/A_OIE_procedures_standards_2016.pdf.

Of all parts of the 'excessivity test', the *identification and validity of a proposed alternative* measure is characterized by the most legal uncertainty in application by the DSB. However, the *identification* of the alternative measure appears almost randomly in the DSB argumentation. The lack of articulation of this important preliminary question was the reason for reversing several Panel decisions, for example if the alternative measure had been proposed by the Panel, and not by the party. Similarly, in the 21.5 Panel Report of *Japan – Apples*, the Panel discussed the validity of a proposed measure as an alternative measure under 'economic and technical feasibility', conflating *feasibility* with *validity* of the proposed alternative.[499]

We suggest that the identification and validity of alternatives should be treated separately from the concerns tested in the other three elements of the 'excessivity test' in a preliminary first step of the Article 5.6 test. Such a doctrinal clarification is necessary, given that it was the reason for successful appeals and was conflated within the three other elements in numerous disputes. If taking into account more alternative measures allows finding superior options, then it is not conducive of the court to artificially limit the number of permissible alternatives. However, we also observed a dominance of the recognized multilateral SPS standards as alternative measures that consistently trump an Article 5.6 SPS analysis.

4.6.2 Article 5.6 as 'excessivity test': Pure trade liberalization rationale

Necessity testing has been criticised as being 'overbroad and underinclusive', leading to a 'truncated maximization, or truncated comparative cost-benefit analysis, by keeping the regulatory benefit relatively constant and working on the trade detriment side. It thus evaluates a much more limited range of options, ignoring other groups of options that may be superior.'[500]

The pertinence of this criticism varies significantly for a 'pure' necessity test, and a necessity test that incorporates 'reasonably available' formulations: the latter has regard to regulatory costs, and relates these back to the trade restriction- such a test better reflects the overall implications of a measure, and would lead to more economically sound outcomes.

[499] Panel Report, Japan – Apples 21.5, above n. 405, para. 7911.

[500] See Trachtman, above n. 386, p. 72.

Article 5.6 SPS incorporates a weak reasonableness element that neglects the costs of an alternative measure at domestic level and the importance of the regulatory goals achieved. It is therefore a pure trade liberalization article: the DSB approaches 'reasonably available in terms of technical and economic feasibility' in a narrow way; in fact, it only examines the *possibility*, not the *reasonability*, of a measure. At the time of writing, no dispute has failed to fulfil this condition to date. By contrast, as a legal device, 'reasonableness' could take many different legal shapes, leaning either towards a cost-benefit analysis or proportionality. As Trachtman writes: 'If the reasonableness test amounts to a requirement that the least trade restrictive alternative not be so costly as to countervail the benefits of the regulatory measure, then it bears some resemblance to cost-benefit analysis; excluding from its truncated maximizing analysis only the measurement of benefits of the regulatory measure. If, alternatively, it amounts to a comparison that requires that the regulatory costs not be disproportionately great in comparison to the trade benefits, then it is a kind of proportionality testing.'[501] A strong, or meaningful, reasonableness could therefore relate to the benefit achieved by the regulatory measure (is the regulatory benefit worth it?) *or* relate to the trade gains that accrue (are the trade gains important enough?). This is also one of the main criticisms levied, namely that the least/less trade restrictive alternative always trumps, 'no matter what the domestic regulatory cost'.[502] Including a strong reasonableness criterion in the necessity test could address this problem by placing an 'indeterminate cap on the domestic regulatory cost'.[503] Unfortunately, the interpretation of reasonability and feasibility and the 'excessivity test' ignores actual costs of a regulatory measure.

In addition, the '*significantly* less restrictive to trade' element of the necessity test could require the trade gain to be significant. The DSB did not rely on this possible margin in its case law. It has been argued that GATT/WTO jurisprudence has not explicitly embraced proportionality testing, except to the extent that necessity testing may be viewed as 'shading into proportionality'.[504] Trachtman notes that '[c]omparative proportionality testing includes necessity testing, with a margin. Due to this margin, it is possible that a measure would fail necessity testing, but not be clearly excessive under proportionality testing, if it were only marginally more trade restrictive than another

[501] Ibid., p. 70.
[502] Ibid., p. 72.
[503] Ibid., p. 72.
[504] Ibid., p. 75.

alternative.'[505] The DSB so far has not required a *significant* trade restriction, and therefore Article 5.6 does not 'shade into' proportionality.

Looking at the text of the article, it seems that the drafters did everything to make Article 5.6 SPS a necessity test *with* a reasonable availability component: the words are literally mentioned, even elaborated on (technical and economic feasibility), and, arguably, a margin of appreciation is expressed in the requirement of a 'significant' trade improvement. It is therefore deplorable that the test is currently deployed in a very strict manner, without taking regulatory costs into account (at most paying lip service to this concept) or measuring the extent and importance of the regulatory benefit.[506] While the institution of Article 5.6 at doctrinal level could provide more room for accommodating Members' regulatory choices, the way the 'formula' is currently interpreted requires trade liberalization at all costs if a domestic measure and an alternative proposed measure both meet the ALOP.

The literature questions to what extent the necessity test developed in the GATT[507] is valid for the interpretation of the SPS Agreement, and whether there is divergence between the two legal regimes. Several differences between Article 5.6 SPS and Article XX GATT can be identified. First, the burden of proof is different.[508] In interpreting Article XX GATT, the AB held that the burden of proof is on the responding state to show that alternatives are not reasonably available, 'taking into account a variety of factors including the domestic costs of such alternative[s]'.[509] In SPS disputes, on the other hand, the burden of identifying a *prima facie* valid hypothetical alternative and establishing that each element of Article 5.6 is satisfied is on the complainant. Second, it has been argued previously that the SPS benchmark for the hypothetical measure is higher for the complainant as it requires a *significantly less* trade restrictive measure, in contrast to the approach taken under GATT requiring the original measure to be the *least*-trade-restrictive measure.[510] On this point, our findings showed that such a

[505] Ibid., p. 76.

[506] We thank an anonymous reviewer for commenting that this version of reasonableness could indeed contradict the national sovereignty provided in setting the ALOP by putting into question whether a given regulatory benefit is 'worth it'.

[507] Specifically Article XX GATT, the ten exceptions and the 'chapeau'.

[508] See Dawar and Ronen, above n. 387, Gisele Kapterian (2010), A Critique of the WTO Jurisprudence on "Necessity". *International and Comparative Law Quarterly* 59(1): 89-127, p. 96; Nathalier Bernasconi-Osterwalder, Daniel Magraw, Maria Julia Oliva, Marcos Orellana & Elisabeth Tuerk (2005), *Environment and Trade: A Guide to WTO Jurisprudence.* Routledge, p. 152.

[509] Kapterian, above n. 508, p. 108.

[510] Bernasconi-Osterwalder et al., above n. 508, p. 152.

difference is not supported by past case law interpretations, although it could be interpreted in such a way in the future. GATT necessity is part of a two-tiered structure that first assesses whether a measure is necessary (for example to protect human, animal or plant life or health), before proceeding to test whether it is discriminatory or a disguised restriction. This necessity test can afford to be less strict, because after the first, a second test layer scrutinizes a domestic measure further. By contrast, Article 5.6 SPS has been construed in a stricter way overall, in particular concerning the 'reasonableness' element, possibly due to the fact that it is self-standing. We, however, conclude that *the necessity test in GATT XX (b) is more permissive of trade restrictions for public policy exemptions than Article 5.6 SPS*.

It has been argued that the purpose of the SPS Agreement is 'to detect covert protectionist measures and to elaborate on the Article III GATT non-discrimination discipline'.[511] Others claim a 'post-discrimination trade order'.[512] Under Article 5.6 SPS measures may be struck down for being excessively trade-restrictive. It does not necessitate discrimination, nor does it test indirect discrimination or arbitrary measures. Its exclusive precondition is that an alternative measure exists that would be less restrictive to trade. As we have shown, Article 5.6 SPS aims purely at trade liberalization. Therefore, in its specific area it can be characterized as a 'neo-necessity' test that constitutes both a 'post-discrimination' and a 'post-protectionism' trade discipline.

4.6.3 Article 5.6: Limit to unilateral and reinforcer of multilateral SPS standard-setting powers

The importance of Article 5.6 SPS has grown, as measured by party reliance, extent of treatment by the DSB and outcomes. Further, it is a pure trade liberalization provision. How, then, does the Article 5.6 interpretation influence WTO Members' regulatory power?

From an institutional point of view, looking at *who decides*, the European Commission, for instance, argued in one of its submissions: '[t]he fact that alternative measures must be "reasonably available" and "significantly less restrictive" implies that an appropriate degree of deference must be given to Members' choices of SPS measures', and requires

[511] Rigod, above n. 393, p. 530.

[512] Mavroidis in Rigod, above n. 418.

'placing a high evidentiary burden upon complaining Members'.[513] Such deference is not supported by the case law; instead the outcomes of Article 5.6 disputes often vastly interfered with and therefore limited Members' regulatory choices.

On the one hand, it is argued that WTO rules can act as a 'shield' to protect domestic regulation, or, on the other hand, as a 'sword' with which to challenge regulation. Previous authors have demonstrated the use of WTO rules as a sword or shield in the case of Japan's trade policy in a variety of areas;[514] the EU's data privacy standards;[515] and ISO standards.[516] In the realm of SPS standards and measures, we argue that Article 5.6 SPS is a powerful legal institution that facilitates challenges to domestic SPS measures, and therefore provides a counter-narrative to unilateral regulatory globalization in the realm of SPS measures. This power of individual countries to regulate global markets has been referred to by various catch phrases, such as 'extra-jurisdictional impact',[517] 'back impact',[518] 'unilateral regulatory globalization',[519] the 'Brussels Effect'[520] and 'territorial extension'.[521] These theories generally acknowledge the restraining effect of the WTO on the unilateral regulatory power of large states. However, in global regulation theory and the WTO, the specific instrument of Article 5.6 SPS is often overlooked.[522] The pure trade liberalization aspect of Article 5.6 SPS provides an argument against theories that individual WTO Members use their power to impose their own standards, at least in the field of SPS.

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[513] Panel Report, Australia – Apples, above n. 356, para. V.35.

[514] Saadia M. Pekkanen (2001), Aggressive Legalism: The Rules of the WTO and Japan's Emerging Trade Strategy. *World Economy* 24(5): 707-737; Saadia M. Pekkanen (2002), *Sword and Shield. The WTO Dispute Settlement System and Japan.* In Ulrike Schaede and William Grimes (Eds.), *Japan's Managed Globalization: Adapting to the Twenty-First Century*. M.E. Sharpe.

[515] Shaffer, above n. 6; Shaffer, above n. 64.

[516] 'ISO standards may operate either as a sword—a negative standard used to challenge a domestic regulatory action—or a shield—an internationally agreed reference point that bolsters the legitimacy of a national measure'; David A. Wirth (2009), The International Organization for Standardization: Private Voluntary Standards as Swords and Shields. *Boston College Environmental Affairs Law Review* 36(1): 79-102.

[517] Shaffer, above n. 6.

[518] Wirth, above n. 1.

[519] Bradford, above n. 1.

[520] Ibid. On the relationship between the WTO and the Brussels Effect, see Sinopoli & Purnhagen, above n. 344.

[521] Scott, above n. 26,

[522] The 'mandate' of the WTO as described by Bradford, for instance, is characterized as a discrimination test only; other authors point out the distinction between discrimination and disguised restriction, but in the context of the SPS Agreement, do not include the provision of 5.6 SPS. Chang-Fa Lo (2012), The Proper Interpretation of 'Disguised Restriction on International Trade' under the WTO: The Need to Look at the Protective Effect. *Journal of International Dispute Settlement* 4(1): 111-137.

Trade has been argued, paradoxically, to trigger both a 'race to the bottom' and a 'race to the top'[523] of standards. The case law we examined, by contrast, supports the convergence of standards at multilateral level: the application of Article 5.6 leads to a shift of the locus of regulatory power towards the international standards of the three SPS-endorsed standard-setting bodies, which decisively influenced case outcomes, either as 'irresistible' alternative measures or as supporting the technical and economic feasibility of alternative measures. In terms of standard-setting powers, Article 5.6 SPS therefore provides (at least potentially) not only a negative limit to unilateral global standard-setting by WTO members. We have seen the predominance of international standards in tipping the balance in the application of the 'excessivity test', resulting in a multilateral convergence of standards that locates the regulatory power in the respective international standard-setting bodies, i.e. the Codex Alimentarius, OIE, and IPPC. Article 5.6, therefore, strongly reinforces the recognized SPS international standard-setting bodies.

4.7 Conclusions

Overall, the importance of the 'excessivity test' in Article 5.6 SPS has matured. Although the number of SPS disputes slightly declined, Article 5.6 SPS has been cited in nearly all recent SPS disputes, indicating a stronger litigation interest. Regarding outcomes, we observe three waves: an early phase of *tension*, with Panels finding a violation of Article 5.6 and the AB overturning decisions; a phase of *hesitation* around 2010 characterized by few cases and reports failing to reach conclusions; and after 2012 a phase of *stricter application* in which in all cases Article 5.6 violations were found.

In terms of trade liberalization, the 'excessivity test' is self-standing and legally very potent due to the weakness of the 'reasonableness' and 'trade gain' requirements applied, and the fact that alternative measures, particularly when based on international standards, are mostly seen to fulfil the often vague definitions of desirable levels of protection to be achieved by domestic SPS regulatory measures.

Article 5.6 SPS acts as an instrument of negative standards levelling, whereby SPS measures may be struck down for being excessively trade-restrictive alone. In terms of standard-setting powers, Article 5.6 SPS therefore provides (at least potentially) a remedy against unilateral global standard setting by a WTO member. This, together with

[523] Vogel, above n. 15; Vogel, above n. 15, p. 3.

the fact that the recognized international multilateral standards are regularly seen as a valid yardstick, results in Article 5.6 SPS as a motor for convergence of SPS standards. These two mechanisms combined provide for a powerful counter-narrative to theories of unilateral regulatory power of WTO members when it comes to SPS measures.

CHAPTER 5

The role of international organizations in the harmonization of phytosanitary standards for vegetable seeds

Abstract

Most countries have adopted phytosanitary regulations for vegetable seeds in order to control the pests and diseases that could be transferred upon importation. Standards vary widely around the world, however, which poses a challenge when exporting vegetable seeds to multiple countries. Harmonization of the regulated pests and diseases and import certificates would reduce the burden of having to adapt to so many different requirements, and would additionally restrict the adoption of unnecessary and potentially protectionist measures. Despite these advantages, harmonization is not always as effective as intended and may have negative impacts on developing countries in particular. Developing a harmonized list of prohibited pests and diseases is technically and politically infeasible, although the *logic* to design phytosanitary standards would be valuable to standardize. This paper investigates the role of international organizations and their relevant schemes in harmonizing phytosanitary standards for vegetable seeds. ISF is compiling a database – the Regulated Pest List Initiative – which contains detailed information on relevant pathogens of vegetable seeds. Additionally, IPPC's ePhyto certification system has the potential to reduce technical barriers of import and export phytosanitary certificates.

5.1 Introduction

International trade potentially serves as a pathway for the entry and establishment of seed-borne pathogens. Most countries have adopted phytosanitary measures[524] for imported seeds in order to reduce the risk of the transfer of pests and diseases, although standards differ. All seeds imported by a country have to meet the domestic phytosanitary requirements of that country.[525] This may result in trade barriers, since it can be a challenge for exporters to meet a variety of standards in order to gain access to different markets around the world. It is even more demanding if the import requirements are unjustified, unnecessarily strict and/or protectionist.

Efforts have been and continue to be made to harmonize national seed phytosanitary laws and trade regulations.[526] Nevertheless, there is still room for more established harmonization of seed laws and certification systems.[527] Following an overview of the benefits and concerns surrounding the harmonization of standards – and phytosanitary regulations in particular – a vision of harmonization is presented. Several relevant international organizations and their harmonization schemes are then discussed, and their role in the harmonization of seed health standards evaluated.

5.2 The importance and reality of harmonization

Seed quality control (testing for *inter alia* health, viability and purity) and certification (declaration that seed identity and uniformity comply with certain standards) were initially developed to help farmers who purchase seed, since neither the variety nor the quality can be determined simply by the appearance of the seed. In the absence of these regulations, farmers would be required to trust the supplier that the seeds are of sufficient quality.[528] Instead, they provide a guarantee for the buyer that seeds comply

[524] Phytosanitary measures may be applied at various stages of seed growth, harvest, processing, storage and trade (i.e. upon arrival in the importing country). FAO and IPPC (2017). *ISPM 38: International Movement of Seeds.*

[525] In addition to internal quality standards of companies and additional customer requirements

[526] OECD (2012), *OECD Seed Schemes: A Synthesis of International Regulatory Aspects that Affect Seed Trade.*

[527] It is important to note that although there are various types of seed laws, including intellectual property rights and those for other quality aspects (germination, varietal purity, etc.), this paper will only address phytosanitary, or disease-borne, measures.

[528] Niels Louwaars (2007). *Seeds of Confusion: The Impact of Policies on Seed Systems*. PhD dissertation, Wageningen University.

with certain standards.[529] The information on seed varieties included in certificates and quality test results is also important for farmers to develop their planning schemes, such as the time of year that is best to plant the seeds.[530]

Seed regulations are primarily created at national level, but they may also impact the international movement of seed. Seed health standards in particular have a very important trade aspect. While differences in germination standards across countries may be cumbersome to international trade, the presence of seed transmitted diseases can have devastating effects. Phytosanitary regulations can serve to avoid the spread of certain plant diseases within a country, although they more importantly exist to avoid the importation of 'new' diseases to a country.

There are large differences in countries' phytosanitary regulations for vegetable seeds. Limited harmonization of seed laws may result in trade barriers, due to the strictness of some phytosanitary measures and the complexity in meeting different import requirements in different countries. For example, varying pests and diseases are regulated, field inspections may or may not be required, and specific laboratory seed health tests may or may not be necessary to meet a country's import requirements. This is a challenge for exporters who have to comply with different standards in order to gain market access around the world. Another major burden is the complexity of documentation necessary for exporting and importing seeds, since the information required in import and export certificates is not standardized.

As an example of the dramatically different pests and diseases that may be regulated, Tables 5.1 and 5.2 summarize the pests and diseases on tomato seeds that are regulated by Mexico and the European Union. There are major disparities between the two places; in the case of Mexico, a very extensive list; and there are even differences based on the country of origin of seeds. In addition, these tables represent only one crop and two places. It poses a challenge for companies to keep track of and apply so many different requirements.

[529] FAO (2007), *Private Standards in the United States and European Union Markets for Fruit and Vegetables: Implications for Developing Countries*, http://www.fao.org/3/a-a1245e.pdf.
[530] Louwaars, above n. 528.

Table 5.1. Mexico: Regulated pests on tomato seeds based on country of origin [531]

	Country of Origin							
Pest	**Chile, China, Denmark, France, Germany, Guatemala, Italy, Japan, Netherlands, Taiwan, USA**	**Costa Rica**	**India**	**Israel**	**Kenya**	**Morocco**	**Peru**	**Spain, Thailand**
Abutilon Theophrasti								x
Alternaria brassicicola		x		x		x		x
Chrysanthemum stunt viroid								x
Clavibacter michiganensis subsp	x	x	x	x	x	x	x	x
Cucumber pale fruit viroid								x
Cuscuta campestris					x			
Orobanche cernua					x			
Orobanche ramosa					x			
Pepper veinal mottle virus					x			
Phoma destructiva		x		x				
Phomopsis vexans		x		x				
Potato spindle tuber viroid		x		x			x	x
Pseudomonas marginalis pv. Marginalis					x			
Pseudomonas syringae pv. Atrofaciens						x		
Pseudomonas syringae pv. Syringae						x		
Pseudomonas syringae pv. Tomato						x		
Pseudomonas viridiflava					x			x
Richardia brasilensis					x			
Tomato black ring nepovirus					x			
Tomato black ring virus						x		
Tomato bushy stunt virus							x	
Tomato ringspot nepovirus							x	
Trogoderma granarium			x	x				
Verticillium dahliae (up to 10%)					x			
Xanthomonas vesicatoria					x			

[531] Servicio Nacional de Sanidad, Inocuidad y Calidad Agroalimentaria, *Módulo de consulta de requisites fitosanitarios para la importación de mercancía de origen vegetal*. Accessed 20 July 2017, https://sistemasssl.senasica.gob.mx/mcrfi/ConsultaCatalogos.xhtml.

Table 5.2. European Union: Regulated pests on tomato seeds[532]

Pest	Country of origin
Clavibacter michiganensis ssp. michiganensis	All countries
Potato spindle tuber viroid	All countries
Xanthomonas campestris pv. Vesicatoria	All countries
Pepino mosaic virus	All countries

The following examples of actual trade barriers further illustrate the importance of science-based phytosanitary requirements for vegetable seeds. China recently demanded a test for *Verticillium* (a fungus) on *Brassica*[533] seeds. However, *Verticillium* is not proven to be a seed-borne disease for these crops, but is instead a soil-borne pathogen. There is therefore logically no seed test for it, making this requirement an unnecessary one to meet. In another example, Zambia declared that all imported vegetable seeds must have undergone a field inspection for *Xanthomonas*. This bacterium can only be detected in the field in cases of severe infection, however, and laboratory tests performed directly on the seeds are much more accurate. This is therefore a needless requirement. In 2015, Japan established a list of pests and diseases on vegetable seeds subject to quarantine requirements.[534] The list is broad and overly comprehensive, and includes the entire genus of *Fusarium*. Although *Fusarium* can be a devastating disease, there are multiple species and only some are harmful. In fact, many *Fusarium* species are so ubiquitous and innocuous that some live on our skin and float through the air. It is therefore unrealistic to include the entire *Fusarium* family on a quarantine list since all imports would be effectively, and unnecessarily, banned.

In addition, the divergences in terminology complicate seed trade. Countries around the world require different wording of the information included on import and export certificates. If a company wishes to export vegetables seeds to a variety of countries, it must prepare different documents that word essentially the same phrase in different ways; this is an unnecessary burden and barrier to trade.[535] For example, additional declarations for tomato seeds are often mandatory to declare that the seeds are free

[532] Council Directive 2000/29, above n. 301; Commission Decision of 27 February 2004 on measures to prevent the introduction into and the spread within the Community of Pepino mosaic virus.

[533] Genus of plants in the mustard family, including cabbage, broccoli, cauliflower, kale and Brussels sprouts

[534] Plant Protection Station, Ministry of Agriculture, Forestry and Fisheries Japan, http://www.pps.go.jp/english/.

[535] One of the goals of ePhyto is to harmonize additional declarations and other information included in certificates

from the regulated pests and diseases. This has to be formulated in writing in a specific way, however. Examples of such mandatory phrasing are: 'free from', 'field inspection', 'growing place free from', 'inspected and free from', 'inspected during growth', 'mother plants inspected', 'parent plants inspected', 'parent plants free from', 'taken from plants not' and 'tested'.

If there would be more globally harmonized seed standards, non-tariff barriers to trade would decrease, market uncertainty would also decrease (since one could expect a certain level of quality), food security would improve and the cost of seed to farmers would be reduced.[536] It is important that governments find a balance between preventing infected seeds from being sold on the market and avoiding unjustified measures that have a negative impact on trade. The widespread adoption of international standards, or the harmonization of standards, would reduce the confusion when determining whether domestic standards have a legitimate scientific basis or are protectionist measures in disguise.[537]

Despite these numerous advantages, harmonization of standards is not viewed only in a positive light. Some critics of harmonization argue that it limits national sovereignty by preventing countries from adopting domestic standards more stringent than those of international organizations or other countries (the so-called 'race to the bottom'). In addition, harmonization may pose barriers for developing countries. While it has been argued that adoption of stringent standards may be a competitive advantage[538], such standards are also often considered to be barriers to accessing developed country markets.[539] Developing countries are essentially required to comply with standards set by developed countries, and face a larger cost of compliance as a result.[540] Finger and Schuler provided some examples of the costs of compliance with SPS measures. It cost US$41.2 million to improve the hygienic conditions of meat processing in Hungary, US$10.0 million to improve the quarantine system in China, US$3.3 million to modernize laboratories in Turkey for residue control and US$82.7 million for an agricultural export reform project in Argentina. It is also debated whether the standards set by

[536] D.D. Rohrbach, I.J. Minde & J. Howard (2003), Looking beyond national boundaries: regional harmonization of seed policies, laws and regulations. *Food Policy* 28(4): 317-333.
[537] Asif H. Qureshi & Nohyoung Park (2013), The WTO as a 'Facilitator' in the Harmonisation of Domestic Trade Laws. *Asian Journal of WTO & International Health Law and Policy* 8: 217-247, p. 222.
[538] Jaffee & Henson, above n. 59.
[539] Graham Mayeda (2004), Developing Disharmony? The SPS and TBT Agreements and the Impact of Harmonization on Developing Countries. *Journal of International Economic Law* 7: 737-764.
[540] Ibid.

international organizations are practical to implement in developing countries, for example whether it is necessary to have expensive seed of high quality, when cheaper seed of sufficient quality is more likely to be successful on local markets. More lenient standards are also more feasible in meeting emergency seed supply requirements.[541]

Van Zwanenberg et al. (2011)[542] and Jansen (2007)[543] argued that the implementation and enforcement of international standards are out of touch with the reality of the situations in developing countries, which Jansen demonstrated with the example of pesticides in Honduras. Jansen reasons that the transfer of international standards to developing counties needs to be further examined. As van Zwanenberg et al.[544] state, 'It is important to ask whose regulatory purposes are being represented and whose are being omitted in the promulgation of international regulatory norms. How are trade-offs and compromises made? And are poorer peoples' interests and perspectives articulated or realized in the construction of regulatory purposes?'[545] Mayeda (2004)[546] referred to this as a 'blind drive for harmonization' and argued it 'fails to recognize the need for countries to adapt laws and legal institutions to domestic conditions'.

5.3 Vision of harmonization

While recognizing both the arguments in favor of and against harmonization, I argue that some harmonization of phytosanitary standards for vegetable seeds is essential.

It would not be ideal to have fully harmonized phytosanitary standards: in that case, all pests and diseases that exist anywhere in the world would be on a list of prohibited pests and diseases, requiring even more unnecessary testing, declarations, etc. Additionally, agro-ecological systems around the world are themselves not 'standardized': the same pathogens may interact in various ways with environments in different parts of the world. As Victor (2002)[547] stated:

[541] Rohrbach et al., above n. 536.

[542] Patrick van Zwanenberg, Adrian Ely, Adrian Smith (2011), *Regulating Technology. International Harmonization and Local Realities.* Earthscan.

[543] Kees Jansen (2007), The Unspeakable Ban: The Translation of Global Pesticide Governance into Honduran National Regulation. *World Development* 36: 575-589.

[544] Van Zwanenberg et al., above n. 542.

[545] Ibid.

[546] Mayeda, above n. 539.

[547] Victor, above n. 133.

> *SPS measures vary across and within nations because preferences and circumstances vary. Simply requiring nations to harmonize the SPS measures to a single standard is neither technically nor politically feasible in the global context. Some nations seek tight protection while others readily consume riskier foods; some pristine environments are vulnerable to pest infestations and require elaborate quarantines for imported products, but other countries are already overrun with pests. It would be difficult to design a single set of international standards that could accommodate such varied preferences and circumstances.*[548]

It is instead important for testing methodologies and the *logic* that is used to develop phytosanitary standards to be harmonized. Even if not all pests and diseases can enter and become established in every territory around the world, it would be valuable to have set lists of which pathogens need to be regulated on which types of seeds, which testing and inspections need to be done and which specific treatments are available. This is important in finding the balance between limiting unnecessary trade barriers, while at the same time ensure that measures are in place to limit the entry and establishment of pathogens. The divergences in import and export certificate wordings and formatting would also benefit from standardization, for example by phrasing the same message in a uniform way and using templates for trade around the world.

National governments are, on the one hand, often in the best position to know which pests and diseases need to be regulated in their territories. On the other hand however, in many situations there is a lack of information or a misunderstanding regarding which pests and diseases need to be regulated. For example, 'there are numerous articles on plant diseases published in which the authors note that the pest in question was found on seed. Often the relevance of such publications is questionable. The presence of a plant pathogen on seed does not necessarily mean that it transmits a disease or that seed is a pathway for establishment of the pathogen. The conclusion drawn of a pest being seed borne or seed transmitted may be based on experimental evidence, limited observations, or in some cases, simply suggestive statements. Many pests that are not seed transmitted or for which seed is not a pathway for establishment are, nevertheless, regulated'.[549] In addition, many national governments cite single, and sometimes outdated, studies as the basis for their regulations, and unfortunately there is a lack of adequate research to correct them.

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[548] Victor, above n. 133, p. 227-228.

[549] ISF, *ISF Pest List Regulated Initiative*. Accessed 12 July 2017, http://www.worldseed.org/our-work/phytosanitary-matters/pest-lists/#isf-regulated-pest-list-initiative.

Although the vegetable seed industry and the food industry certainly have many differences, and it is not possible to assume that what works in one can be applied in the other, an example of a similar vision for harmonization is presented. The Codex Alimentarius Commission is the central organization for the harmonization of standards, guidelines and codes of practice for food safety and quality.[550] Although standards developed by Codex are not compulsory, the organization is recognized by the SPS Agreement as the primary international organization for the regulation of food standards (as the International Plant Protection Convention (IPPC) is for plant health). This means that while WTO members are permitted to apply standards stricter than those of the Codex Alimentarius, where they exist, they must have a scientific justification for doing so. The Codex Alimentarius Commission has helped to create specific international standards for various aspects of food safety and quality. Its 188 members negotiate to develop standards on food hygiene, maximum limits for specific food additives, pesticide and veterinary drug residues, microbial contamination and more. Many countries have even adopted Codex standards as their own. These specific and more widely accepted standards have allowed for further harmonization of food safety and quality measures (although there are certainly differences in legislation and trade issues within the food sector as well!). However, the vegetable seed industry is more complex, as it deals with pathogens and seeds in diverse agro-ecological conditions. The Codex Alimentarius Commission only needs to focus on health impacts for humans, which are the same around the world.

5.4 Unilateral vs. multilateral harmonization

Harmonization may occur via multilateral or unilateral standards. Unilateral regulatory globalization is when 'a single state is able to externalize its laws and regulations outside its borders through market mechanisms, resulting in the globalization of standards…Unilateral regulatory globalization is a development where a law of one jurisdiction migrates into another in the absence of the former actively imposing it or the latter willingly adopting it'.[551] Bradford identified five conditions that must exist for unilateral regulatory globalization to occur: 1) market power, 2) regulatory capacity

[550] Codex Alimentarius Commission, *CODEX Alimentarius: Home*. Accessed 12 July 2017, http://www.fao.org/fao-who-codexalimentarius/en/.

[551] Bradford, above n. 1.

(expertise and resources to enforce its rules), 3) preference for strict rules, 4) predisposition to regulate inelastic targets, and 5) nondivisibility of standards.[552]

In the case of vegetable seeds, it is unlikely that a country would be able to unilaterally set the global standards. The reason for this is explained by applying some of Bradford's characteristics of unilateral regulatory globalization.

5.4.1 Market power

Unilateral regulatory globalization is more likely to occur in countries with a large market size. This is since the exporting country is typically dependent on sales in the importing country market, especially if it is unlikely to divert trade to other markets or increase domestic sales.[553] The top exporters and importers of vegetable seeds are shown in Table 5.3. As can be seen, the EU as a whole is both the main global exporter and importer of seeds, followed by the United States.

Table 5.3. Main exporters and importers of vegetable seeds in 2015

Top exporters[554]	Value of exported seed in USD million	Top importers[555]	Value of imported seed in USD million
Netherlands (EU)	1221	Netherlands (EU)	420
USA	624	USA	381
France (EU)	409	Mexico	295
China	161	Spain (EU)	214
Chile	134	Italy (EU)	180
Israel	131	China	172
Italy (EU)	111	France (EU)	143
Japan	95	Japan	125
Thailand	94	Turkey	105
Germany	70	Canada	97
Australia	22	Australia	45
New Zealand	49	New Zealand	15

[552] Ibid.

[553] Bradford, above n. 1.

[554] ISF, *Exports of Seed for Sowing by Country – Calendar Year 2015.*

[555] ISF, *Imports of Seed for Sowing by Country – Calendar Year 2015.*

5.4.2 Preference for strict rules

The adoption of strict standards, more likely in wealthy countries, is also an essential characteristic for unilateral regulatory globalization to occur.[556]

Unlike in many instances of agriculture and food safety in which the EU has some of the strictest requirements in the world, in the case of phytosanitary requirements for seeds, the EU has relatively lenient standards. There have been no studies on which country has the strictest phytosanitary standards for vegetable seeds. However, Eschen et al. found that for plants for planting (P4P), the EU has the most open approach, whereas Australia and New Zealand implement the strictest regulations (since they have white list approaches and mandate both pesticide treatment and post-entry quarantine).[557] Due to resource and time constraints it was not possible to verify if this is the case for vegetable seeds as well. Nevertheless both Australia and New Zealand make up a small share of the market, and even if another country does have stricter requirements, they will come nowhere close to the EU's market domination.

5.4.3 Nondivisibility of standards

Unilateral regulatory globalization occurs only when an exporter applies the strict standard from the importing country to all of its products, whether they are for the domestic or other importing markets. An exporter has the incentive to do so when production is nondivisible or when adopting a single global standard is more beneficial than applying custom, often less stringent, standards to products for different markets. Advantages of doing so include a single production process (which may be simpler and less expensive than applying varying standards) and maintaining a uniform global brand.[558] Production of vegetable seeds is divisible; it is currently the norm that companies apply different treatments, conduct different tests and produce different certificates for seeds destined for different countries. It is often inconvenient, however, which is why harmonization of seed laws would be advantageous.

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[556] Bradford, above n. 1.

[557] R. Eschen, K. Britton, E. Brockerhoff, T. Burgess, V. Dalley, R.S. Epanchin-Niell, K. Gupta, G. Hardy, Y. Huang, M. Kenis, E. Kimani, H-M Li, S. Olsen, R. Ormrod, W. Otieno, C. Sadof, E. Tadeu & M. Theyse (2015), International variation in phytosanitary legislation and regulations governing importation of plants for planting. *Environmental Science & Policy* 51: 228-237.

[558] Bradford, above n. 1.

The application of these criteria, as well as general observations about the industry, demonstrate that there is no dominating country that sets the standards for global vegetable seed trade.

The following section looks into the role of international organizations in harmonizing phytosanitary standards for vegetable seeds.

5.5 International organizations and their harmonization schemes

The following section provides an overview of various international organizations in the vegetable seed sector and their harmonization schemes. The focus of the analysis is on harmonization of phytosanitary issues. Only international organizations were selected; various regional organizations do support harmonization, but they were not taken into account in this paper.

5.5.1 International Standards for Phytosanitary Measures (ISPM)

The International Plant Protection Convention (IPPC) is a multilateral treaty within the Food and Agriculture Organization (FAO) that aims 'to prevent the introduction and spread of plant and plant product pests, and to promote appropriate measures for their control'.[559] Its governing body, the Commission on Phytosanitary Measures (CPM), oversees the implementation of the IPPC. The focus of its work is on setting and implementing international standards.[560]

The IPPC gained relevance in the international arena in 1995 after the enactment of the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) of the WTO, which stated that phytosanitary measures must be based on science or international standards, guidelines or recommendations. The IPPC is specifically recognized as the relevant organization for international standards, guidelines and recommendations on plant health. The majority of countries in the world (183) are

[559] IPPC, *About*. Accessed 12 July 2017, https://www.ippc.int/en/structure/.
[560] IPPC, *Standards and Implementation*. Accessed 12 July 2017, https://www.ippc.int/en/core-activities/standards-and-implementation/.

members of the WTO or contracting parties to the IPPC[561], and are therefore expected to comply with their international obligations. There are currently ten Regional Plant Protection Organizations (RPPOs) around the world that work with the IPPC to facilitate international harmonization of national phytosanitary measures.[562] Several IPPC Regional Workshops are organized every year around the world in order to 'help participants understand the phytosanitary realities and challenges of each region' and 'receive input on how to better integrate these realities'.[563]

The International Standards for Phytosanitary Measures (ISPMs) developed by the IPPC are recognized as the basis for phytosanitary measures applied in trade by WTO Members (IPPC 2017b). They are themselves not regulatory instruments, but provide a basis for countries to establish requirements in their own national legislation.[564] There are a total of 41 ISPMs, which cover principles for plant quarantine, determination of pest status and pest risk analysis, the use of biological control agents, the establishment of pest free areas, export certification systems and more.[565] Many of them are relevant for trade in seeds. Additionally, on 15 May 2017, ISPM 38 on the 'International Movement of Seeds' was adopted. The focus of this standard is on 'identifying, assessing and managing the pest risk associated with the international movement of seeds. The standard also provides guidance on procedures to establish phytosanitary import requirements to facilitate the international movement of seeds; on inspection, sampling and testing of seeds; and on the phytosanitary certification of seeds for export and re-export'.[566]

Although ISPMs are not legally binding under the IPPC, WTO Members are required to base their SPS measures on international standards, guidelines or recommendations, where they exist. They can choose to have stricter phytosanitary measures, but then they must have a scientific justification for doing so.[567] It is still unclear what impact this ISPM38 will have on actual national phytosanitary rules and their implementation.

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[561] IPPC, *Structure*. Accessed 12 July 2017, https://www.ippc.int/en/structure/.
[562] IPPC, *Adopted Standards (ISPMs)*. Accessed 12 July 2017, https://www.ippc.int/en/core-activities/standards-setting/ispms/.
[563] IPPC, *IPPC Regional Workshops*. Accessed January 18, 2018, https://www.ippc.int/en/core-activities/capacity-development/regional-ippc-workshops/.
[564] IPPC, *Standard Setting*. Accessed 12 July 2017, https://www.ippc.int/en/core-activities/standards-setting/.
[565] IPPC, *Adopted Standards (ISPMs)*. Accessed 12 July 2017, https://www.ippc.int/en/core-activities/standards-setting/ispms/.
[566] FAO and IPPC (2017), *ISPM 38: International Movement of Seeds*.
[567] SPS Agreement

ISPM standards provide a general basis for national phytosanitary legislation, but are too vague to harmonize specific phytosanitary standards. For example, according to ISPM 38 on the International Movement of Seeds, countries must conduct a Pest Risk Analysis (PRA) to identify which pests should be regulated, the different types of seed-borne pests are generally categorized and examples provided, general suggestions for pest management are provided for the various stages of seed production, and processing and treatment options are listed. While this is all important information and serves as a basic guidance document for national governments to establish phytosanitary measures, it does not go into enough detail to harmonize them.

5.5.2 Regulated Pest List Initiative

The International Seed Federation (ISF) is a non-governmental organization that 'represents the interests of the seed industry at a global level'[568], specifically at international organizations such as the Organisation for Economic Co-operation and Development (OECD), International Union for the Protection of New Varieties of Plants (UPOV), International Plant Protection Convention (IPPC), Food and Agriculture Organization (FAO) and World Intellectual Property Organization (WIPO). ISF also aims to facilitate the free international movement of seed, publish rules for trading seed, keep members informed of latest technology and developments and settle trade disputes, among others.[569] It consists of 223 Members from 74 countries, covering 97% of global trade in seeds. Unlike many of the other organizations which focus on government membership, ISF's members are national seed associations and seed companies.

As discussed already, many existing phytosanitary measures are unnecessary. ISF created lists of the pathogenic organisms (bacteria, fungi, insects, viruses, etc.) for crop seeds that are regulated by NPPOs around the world. Experts in the field, namely seed and field pathologists, then interpret scientific publications to determine whether seed may be a pathway for each pest, and if so, the conditions for its establishment.[570] These ISF Pest Lists make up the ISF Regulated Pest List Initiative database. The database currently covers ten crops, and includes information on potential pests, their

[568] ISF, *About – What We Do*. Accessed 8 March 2017, http://www.worldseed.org/about/what-we-do/.
[569] Ibid.; ISF. *Dispute Settlement – Mediation, Conciliation and Arbitration*, Accessed 8 March 2017, http://www.worldseed.org/our-work/trade-rules/#dispute-settlement.
[570] ISF, above n. 549.

classification (if the pest should be regulated or not), and information on testing and treatment methods, if applicable.[571]

The ISF Regulated Pest List Initiative has the most potential to achieve harmonization of phytosanitary standards. The lists of potential pests, if the pests should be regulated or not, and information on any relevant testing and treatment methods[572], all developed by experts in the field, are a valuable resource for countries to know which pests should be regulated for which crops. This would help to reduce the number of existing phytosanitary measures that are unnecessary. The current limitations are that the database only exists for ten crops, and it is not (yet) widely adopted.

5.5.3 Quality Declared Seed (QDS)

The priority of the Food and Agriculture Organization (FAO) of the United Nations is to achieve food security for all.[573] One of its main areas of work was identified as enabling inclusive and efficient agricultural and food systems. This includes increasing the participation of smallholders in the increasingly integrated and globalized food and agriculture value chains.[574] 'Outdated, inefficient and sometimes conflicting policies, laws and regulations, together with uncertain government perceptions of public and private sector roles and responsibilities…impede the investments necessary to sustainably improve inclusiveness and efficiency in global, regional and national markets'.[575]

FAO established the Quality Declared Seed (QDS) system in the 1980s.[576] It provides a source of practical information on seed standards and is available for a total of 92 species of crops. It aims to provide for the development of the agricultural sector. The purpose is to provide good quality seed even under conditions of limited resources, for example, for the crops, regions and farming systems where other more advanced seed quality control systems are too demanding to implement.[577] Therefore, the system was

[571] ISF, *ISF Regulated Pest List Database*. Accessed 12 July 2017, http://pestlist.worldseed.org/isf/pest_lists_db.html.
[572] Ibid.
[573] FAO, *About FAO*. Accessed 12 July 2017, http://www.fao.org/about/en/.
[574] FAO, *What We Do*. Accessed 12 July 2017, http://www.fao.org/about/what-we-do/en/.
[575] Ibid.
[576] FAO (2006), *Quality Declared Seed System*. FAO Plant Production and Protection Paper.
[577] Ibid.

designed in a way 'to provide quality control during seed production, which is less demanding on government resources than other more developed quality systems', yet still produce good quality seed.[578] It has also been particularly valuable as a source of seed and established quality standards for seed relief interventions after natural disasters or other catastrophes.

The QDS system of the FAO 'is not proposed as a global scheme, which countries would formally recognize or adopt as a basis for trade'.[579] It rather aims to facilitate seed trade in countries where no other scheme exists or where official certification is not practical when applied to remove and small-scale seed production- and to provide a basis from which to develop seed standards.[580] QDS consists of the minimum standards and procedures that must be applied in order for seed to be classified as Quality Declared Seed. National governments are authorized to grant the designation if it determines that the requirements have been met.[581] QDS is made up of standards for different types of crops, and covers issues such as varietal and species purity, weeds, field inspections, seed quality standards (e.g. germination, purity, moisture content). However, QDS only includes a general statement on seed-borne diseases: 'The seed field must be within the standards for seed-borne diseases specified by each country according to local needs'.[582] Instead of harmonizing which diseases should be regulated, it is still left open to each country- which is logical as the main aim of QDS is on quality, and it will only focus on the most important diseases at any specific location.

5.5.4 Seed Schemes

The Organisation for Economic Co-operation and Development (OECD) aims to 'promote policies that will improve the economic and social well-being of people around the world'.[583] It provides a forum for governments to collaborate on solutions to common problems, including setting international standards in a variety of fields. It consists of 35 members, nearly all of which are the most advanced countries in the world.[584]

[578] Ibid.
[579] Ibid., p. 6-7.
[580] Ibid.
[581] Ibid.
[582] Ibid., p. 185.
[583] OECD, *About the OECD*. Accessed 12 July 2017, http://www.oecd.org/about/.
[584] OECD, *Members and Partners*. Accessed 12 July 2017, http://www.oecd.org/about/membersandpartners/.

The OECD's Seed Schemes were established in 1958 to promote the consistent high quality of seeds. It is an international seed certification system, aiming to 'facilitate seed trade by reducing technical barriers, improving transparency and lowering transaction costs'.[585] The Seed Schemes are open to OECD countries as well as other UN or WTO Members[586]; there are currently 58 members.[587] If seed is produced and processed in accordance with the principles of the Seed Schemes, it will receive a corresponding label and certificate. 'Each Scheme includes a set of Rules and Regulations aiming at the varietal certification of seed, except for the Vegetable Seed Scheme where generally traded seed, "Standard Seed", may not be certified but only controlled'.[588] The annual List of Varieties eligible for OECD Certification includes about 49,000 varieties from 200 species. The technical requirements are comprised in the Rules and Regulations of the OECD Seed Schemes. The Schemes ensure the varietal identity and purity of the seed through appropriate requirements and controls throughout the cropping, seed processing and labelling operations. The OECD certification provides for official recognition of 'quality-guaranteed' seed.[589]

OECD's Seed Schemes are used globally in seed trade, but only in the countries that participate in the program and that have had their certification procedures validated by the OECD. If a crop is found to conform to the standards of the Seed Schemes, OECD certification labels are placed on the seed sacks. Additionally, some countries have accepted the OECD Seed Schemes as their own national standards.[590] The standards set minimum requirements for field inspections, purity, isolation, etc. However, they do not provide any specific guidance on phytosanitary or seed quality standards. The various standards for crops include statements such as 'Seed-borne diseases that reduce the usefulness of the seed shall be at the lowest possible level'[591], 'The seed shall have been tested in a laboratory….if appropriate, for freedom from specific seed-borne diseases'[592] and 'The seed used for seed crop production should be as pest and disease free as possible. Its health should be checked before use and, if pest or disease organisms

[585] OECD, above n. 526, p. 4.
[586] OECD (2017), *OECD Seed Schemes 2017: OECD Schemes for the Varietal Certification or the Control of Seed Moving in International Trade.*
[587] OECD, *About the OECD Seed Schemes*. Accessed 12 July 2017, http://www.oecd.org/tad/code/abouttheoecdseedschemes.htm.
[588] OECD, above n. 586, p. 12.
[589] OECD, above n. 587.
[590] FAO, above n. 576.
[591] OECD, above n. 586, p. 110.
[592] Ibid., p. 150.

against which there is an effective seed treatment are present, that treatment should be applied'.[593] Similar to the QDS system, there is no attempt to harmonize the seed-borne diseases to be regulated.

5.5.5 ePhyto

While not directly addressing a phytosanitary issue, ePhyto is still relevant and important to address in a discussion of harmonization.

The IPPC has also encouraged the use of electronic versions of phytosanitary certificates by developing ePhyto, which stands for 'electronic phytosanitary certificate'. The same information that is included in a typical paper phytosanitary certificate is also in the ePhyto; the advantage is that ePhytos can be exchanged electronically. This allows for greater efficiency (reduced data entry and validation), fewer delays (more efficient arrival and clearance at the point of entry, facilitates replacement of certificates when required), digitally structured information, more secure (reduced potential for fraudulent certificates, improved security in the transmission of certificates) and shorter routes.[594] Appendix 1 of ISPM 12 describes the format, contents and exchange of ePhytos.[595] It also reduces the risk of typos, as for example commas or periods are sometimes required in certain certificates. When proper electronic formats are used, such problems can be avoided.

ePhyto is a recent project and is still under construction. The aim of the ePhyto system is to develop a hub and generic national system (GeNS) for the internationally harmonized transfer of the certificates. 'The hub facilitates transfer of certificates from the national plant protection organization (NPPO) of the exporting country to the NPPO of the importing country using a harmonized protocol. The generic national system allows NPPOs to produce and send an ePhyto to the hub. It also allows NPPOs to retrieve ePhytos from the hub for imported consignments'.[596] Pilots are currently being developed to evaluate the systems and ensure that they produce, transfer and receive the ePhytos effectively.[597]

[593] Ibid., p. 153.

[594] IPPC, *Electronic Phytosanitary Certification (ePhyto).* Accessed 12 July 2017, https://www.ippc.int/en/ephyto/.

[595] IPPC, *ePhyto*. Accessed 12 July 2017, http://ephyto.ippc.int.

[596] FAO and IPPC (2016), *ePhyto Factsheet #9*.

[597] ISF, above n. 549.

IPPC's ePhyto also has major potential to achieve harmonization. While it does not aim to harmonize which pests and diseases should be regulated in which crops, it does intend to standardize certificates as much as possible. A major opportunity with ePhytos is the potential for global harmonization of formatting and wording. IPPC promotes the use of harmonized codes and terms to facilitate international trade of seeds, including country codes, scientific names, units of measure, treatment types, additional declarations and more.[598] An example of the variations in the wording of additional declarations was shown above. IPPC has developed a list of standardized phrases that can be used to simplify the variations required in producing certificates for different importing countries. It also provides templates for e.g. export and re-export certificates.[599] Nevertheless, it is still a very new scheme with pilots underway, so the extent to which it can achieve harmonization is still to be determined.

5.6 Conclusions

As discussed above, there are major disparities in countries' phytosanitary regulations for vegetable seeds, since different pests and diseases are regulated, different field and laboratory inspections and tests are required, and different information is mandated on seed certificates. This results in a challenge for exporters that are obliged to comply with a variety of standards in order to gain access to markets in different countries. Of course there are reasons for differential regulation. If a disease is already widely present in a country, imported seed carrying that disease will not do much damage. When the disease is *not* present, there are good reasons to keep it out. Full harmonization of all aspects of phytosanitary regulations is therefore not the goal.

The aim of this research was to determine the role of international organizations in achieving global harmonization in the area of phytosanitary standards for vegetable seeds. Although harmonization of standards can be viewed in a negative light, I argue that some harmonization, i.e. regarding which pests and diseases should be regulated, which tests and inspections should be required, and import and export certificates could benefit from further harmonization. ISF's Regulated Pest List Initiative, with the detailed list on which and how pests should be regulated, and IPPC's ePhyto system, aiming to standardize certificates, do have the potential to meet these goals. Such guidelines would provide a basis for which phytosanitary issues should be regulated.

[598] IPPC, above n. 595.

[599] Ibid.

Until, if ever, there is any further harmonization of phytosanitary standards, seed companies will be left with the burden of having to comply with many different requirements. Countries will be more likely to get away with protectionist or, in any case, scientifically unjustified standards. While it is possible to challenge them in the WTO's dispute settlement system or via other dispute settlement mechanisms, these procedures usually take years and lead to sales losses during the meantime. A major reason for some of the trade barriers is uncertainties and a lack of information regarding relevant pathogens. It is therefore recommended to increase research on relevant pests and diseases.

CHAPTER 6

Conclusions and general discussion

6.1 Introduction

This dissertation contributes to research on standards in the WTO context by investigating the influence of the WTO on constraining or enabling the extraterritorial effect from the perspective of the WTO law rationale. It examined an important and previously understudied area, namely how international economic law regulates sanitary and phytosanitary measures. In order to do so it conducted a doctrinal analysis of the legislation and jurisprudence, and further studied the legal impacts on national regulations.

6.2 Answering and discussing the research questions

6.2.1 Research question 1: How does the extraterritorial effect of SPS measures impact trading partners in practice?

While the extraterritorial effect has been observed in a variety of areas at an abstract level, its concrete effects on trade have barely been investigated. In order to study the influence of WTO law on the extraterritorial effect of SPS measures, it was important to first understand if, and how, the extraterritorial effect of SPS measures impacts trading partners in practice. The question was answered by looking at the legal impacts of three previous (Chapter 2) and an ongoing (Chapter 3) trade disputes. This research found that the extraterritorial effect is observed in the SPS sector, as trade partners have *de facto* and in some instances *de jure* adopted the standards of the dominant country. Despite the fact that the exporters were opposed to the standards of the importing country, they chose to adopt them rather than forgo the critical markets.

Chapter 2 presented three examples of the extraterritorial effect in previous trade disputes. For the *EC – Approval and Marketing of Biotech Products* dispute, this dissertation showed that countries dependent on trade with the EU modified their policies and practices regarding GMOs in order to maintain their access to its market. Zambia even rejected food aid (GM corn) from the US; the president stated the country would 'rather starve'[600] than accept it, out of fear that the corn seed would contaminate the local supply, and lead to the restriction of Zambian exports to the EU. Similarly, in the *EC – Hormones* dispute, Argentina, Uruguay and the US took specific actions just to

[600] Drezner, above n. 162, p. 169.

access the EU market. The *Dolphin – Tuna* case was also studied in this article, and while it is a TBT rather than an SPS dispute, it is still relevant for the food sector. Several nations modified their fishing procedures in order to comply with US law in response to its import restrictions.

Chapter 3 showed that South Africa 'traded up' to meet the EU's stringent phytosanitary measures on the fungus causing citrus black spot (CBS) disease. Due to the threat of losing access to the lucrative EU market, South African authorities, industry groups and producers implemented additional risk management measures, such as limiting the orchards that could export to the EU; requiring additional treatments, testing and inspections; and even imposing a voluntary suspension. These measures were not taken because South Africa believed CBS could become established in the EU; in fact, South Africa disagreed with the EU's zero tolerance approach to the presence of the fungus on citrus fruit. Nevertheless, in order to not face a full ban, South Africa had to factually adapt to the EU's phytosanitary standards. The EU, as the bigger trading partner, was able to impose its standards on South Africa, the smaller trading partner.

These observations are in line with previous research on the extraterritorial effect of measures[601], which found that trading partners often adopt the laws of the country to which they are exporting if the market is too important to forgo. Chapter 2 assessed from a legal perspective the conditions of the extraterritorial effect (as described specifically in the context of the Brussels Effect by Anu Bradford) and found that not all of the conditions are required for it to occur. The effect was still present even when products were divisible and when a country did not have full market power.

As written in the introduction, 'extraterritorial effect' was selected as an umbrella term describing when a stringent regulatory standard of an economically strong jurisdiction migrates to another jurisdiction on the back of traded goods. It has most frequently been demonstrated with the exportation of EU regulatory standards. In Chapters 2 and 3 I described the extraterritorial effect of measures from the EU and US (which used to be a more dominant global regulator). In Chapters 4 and 5, however, it was observed that the scope is broader than originally thought. Many more countries, including developing countries, enacted measures with a *de facto* extraterritorial effect. While no *de jure* or global (or even necessarily nation-wide) adoption was observed with this broader view, it was still interesting to see that these markets were important enough that exporters did not want to bypass them.

[601] Bradford, above n. 1; Shaffer, above n. 5; Scott, above n. 2.

This research found that the extraterritorial effect of measures had a negative economic impact on trading partners. In the case of the dispute on citrus black spot disease between the EU and South Africa, having to adapt to the EU's stringent requirements was costly for South Africa. It was estimated that in one year the industry lost a total of ZAR 1 billion (EUR 66 million), about half in revenue and the other half in additional treatment costs. Although the general consensus is that standards are barriers to trade,[602] some authors have argued that when developing countries in particular adopt the more stringent standards of an importing country, they might serve as a 'catalyst'[603] for change. In the case of food trade, this may lead to e.g. safer food for the domestic market and higher quality, more marketable products for the export market. However, in this case, it is unknown if there is potentially a more long-term positive effect. Even though South African citrus fruit is successfully exported to numerous countries around

[602] Chunlai Chen, Jun Yang & Christopher Findlay (2008), Measuring the Effect of Food Safety Standards on China's Agricultural Exports. *Review of World Economics* 144(1): 83–106; Anne-Celia Disdier, Lionel Fontagne & Mondher Mimouni (2008), The Impact of Regulations on Agricultural Trade: Evidence from SPS and TBT Agreements. *American Journal of Agricultural Economics* 90(2): 336–350; Gebrehiwet et al., above n. 268; Juthathip Jongwanich (2009), The Impact of Food Safety Standards on Processed Food Exports from Developing Countries. *Food Policy* 34(5): 447–457; Tsunehiro Otsuki, John S. Wilson & Mirvat Sewadeh (2001), Saving Two in a Billion: Quantifying the Trade Effect of European Food Safety Standards on African Exports. *Food Policy* 26(5): 495–514; Tsunehiro Otsuki, John S. Wilson & Mirvat Sewadah (2001), What Price Precaution? European Harmonisation of Aflotoxin Regulations and African Groundnut Exports. *European Review of Agricultural Economics,* 28(3), 263– 284; John F.M. Swinnen & Thijs Vandermoortele (2011), Trade and the Political Economy of Food Standards. *Journal of Agricultural Economics* 62(2): 259–280; Ning Yue, Hua Kuang, Lin Sun, Linhai Wu & Chuanlai Xu (2010), An Empirical Analysis of the Impact of New Food Safety Standards on China's Tea Exports. *International Journal of Food Science and Technology* 45(4): 745–750; Oscar Melo, Alejandra Engler, Laura Nahuehual, Gabriela Cofre & Jose Barrena (2014), Do Sanitary, Phytosanitary and Quality-Related Standards Affect International Trade? Evidence from Chilean Fruit Exports. *World Development* 54: 350-359; John S. Wilson & Tsunehiro Otuski (2002), To Spray or Not to Spray: Pesticides, Banana Exports and Food Safety. *World Bank. Policy Research Working Paper*, No. 2805.

[603] Jaffee & Henson, above n. 59, p. 1; Spencer Henson & John Humphrey (2010), Understanding the Complexities of Private Standards in Global Agri-food Chains as they Impact Developing Countries. *Journal of Development Studies* 46(9): 1628–1646; Spencer Henson & Steven Jaffee (2008), Understanding Developing Countries Strategic Responses to the Enhancement of Food Safety Standards. *World Economy* 31(4): 548–568; Spencer Henson, Oliver Masakure & John Cranfield (2011), Do Fresh Produce Exporters from Sub-Saharan Africa Benefit from GlobalGAP Certification? *World Development* 39(3): 375–386; Nicodeme Nimenya, Pascal-Firmin Ndimira & Bruno Henry de Frahan (2012), Tariff Equivalents of Non-tariff Measures: The Case of European Horticultural and Fish Imports from African Countries. *Agricultural Economics* 43(6): 635–653; Ian Sheldon (2012). North–South Trade and Standards: What Can General Eequilibrium Analysis Tell Us? *World Trade Review* 11(3): 376–389; S.M. Anders & J. Caswell (2009), Standards as Barriers Versus Standards as Catalysts: Assessing the Impact of HACCP Implementation on U.S. Seafood Imports. *American Journal of Agricultural Economics*, 92(2), 310-321.

the world, if producers improve the quality of their citrus fruit, it would perhaps become even more profitable.

6.2.2 Research question 2: How is SPS law applied and interpreted as a 'sword' or 'shield' by the WTO Dispute Settlement Body?

This question looked into how SPS law may constrain or enable the extraterritorial effect of measures through its application and interpretation by the WTO Dispute Settlement Body (DSB). It was addressed by studying the requirements that measures must be based on science (Article 2.2, Chapter 3) and not more trade restrictive than necessary (Article 5.6, Chapter 4). This dissertation also went beyond the black-letter law of the dispute rulings and examined the effect of extraterritorial measures even after WTO rulings by looking into the impact *in action* (Chapter 2). This research shows that the DSB applies and interprets SPS laws in ways that may act as either a 'sword' or a 'shield' for the extraterritorial effect, depending on the provision studied.

This dissertation addressed the legal uncertainty left by the SPS Agreement regarding its normative requirements for justifying SPS measures. According to Article 2.2 of the SPS Agreement, measures must be based on science. In certain cases the scientific facts are undisputed but are interpreted differently by countries. This may result in a 'battle of science', as both positions can be justified by science. Without clarity as to how scientific facts should be interpreted, e.g. if a small risk is enough to justify an SPS measure, market forces can take over and bigger trading blocs can impose their standards on their trading partners through an extraterritorial effect. This research looked into WTO case law to find if the DSB has interpreted the 'science' requirement in previous disputes. It was found that there is only a weak benchmark against which scientific data may be evaluated. The *possibility* and not only the *probability*[604] of a risk must be established, and SPS measures must be 'sufficiently supported or reasonably warranted by the risk assessment'[605], but there is limited elaboration on what these terms mean. The lack of a defined normative standard for science can be used by dominant countries to their advantage. The uncertainty with regards to how science, and the uncertainty in science, need to be interpreted can be used as a shield for bringing forward unnecessarily strict and even protectionist policies shielded as a 'scientific necessity'.

[604] Appellate Body Report, Australia – Salmon, above n. 252, para. 123.

[605] Appellate Body Report, EC – Hormones, above n. 250, para. 186.

Whereas Article 2.2 may hence serve as a shield for the extraterritorial effect of SPS measures, Article 5.6 may be used as a sword to challenge such measures. Article 5.6 states that measures should not be more trade restrictive than required to achieve the ALOP. In order to challenge a Member's measure under this article, a country must put forward an alternative measure that is 1) reasonably available, 2) meets the challenged Members' ALOP and 3) is significantly less restrictive to trade. Chapter 4 found that Article 5.6 is a pure trade liberalization provision: measures were found to be in violation of SPS law for the sole reason that a less trade-restrictive alternative measure existed (as long as it was reasonably available and met the importing country's ALOP). The proposition of a less-trade restrictive alternative measure was therefore seen as a sword with which to strike down measures with an extraterritorial effect. It was observed, however, that the DSB shies away from science; proposed alternative measures with a scientific basis were less likely to be accepted as valid alternatives.

Furthermore Chapter 2 went beyond the dispute rulings to look at the actual impact that they had. It was found that while the WTO aimed to restrict the extraterritorial effect of measures, and did so when looking in the black-letter of the WTO rulings, it was not able to limit the extraterritorial effect *in action*: it had limited impact on the way the dominant regulator acted. It was found that there was what has elsewhere been called 'reform without change'[606] in the case of the GMOs dispute. Even though the DSB ruled against the EU, it had little effect on GMOs in the EU in practice. Although many GM crops are imported for animal feed, GM foods for humans are in limited numbers on the market and Member States can reject the cultivation of GMOs in their territories. The EU did not comply with the DSB's rulings in the *EC – Hormones* dispute, and the US and Canada responded with retaliatory tariffs. The EU preferred to accept retaliation rather than bring its measures in compliance with the WTO ruling, which it was within its rights to do. Shaffer[607] and Bradford[608] also observed that the WTO serves as a shield for the extraterritorial effect of measures as it limits the impact of retaliation. The DSB ruled against the US in *Dolphin – Tuna* (again, a food-related TBT dispute), and brought its measures into compliance with WTO rules (i.e. non-discrimination), but they still had an extraterritorial effect in other countries. Despite the rulings against the extraterritorial effect of measures, these three examples show how the weak impact of WTO laws may be used to shield measures with an extraterritorial effect.

[606] Pollack & Shaffer, above n. 46, p. 260.

[607] Shaffer, above n. 6, p. 419; Shaffer, above n. 64, p. 7-8, 46.

[608] Bradford, above n. 1, p. 56.

It is unclear if the DSB interprets and applies SPS rules more as a 'sword' or a 'shield', or if it is primarily case- and provision-dependent. None of the disputes analysed in Chapter 2 invoked Article 5.6; it was found, however, that Article 5.6 has been invoked more frequently over time, and those disputes were from the early days of the WTO. If it had been addressed, it is possible that this trade liberalization article would have been a powerful enough sword to actually prevent the measures with an extraterritorial effect. Or, perhaps, countries enacting the extraterritorial measures might still have been able to shield them by using the WTO rules to their advantage.

When answering this research question the topic of science frequently emerged. Two different types of extraterritorial measures were identified in this research. The first is measures that are more stringent than those of an international standard or another country. This was often the result of a different value judgment or a different interpretation of science that can be legitimately justified ('battle of science' issue). The second type is those measures that are stringent but do not have a scientific justification, perhaps due to purely protectionist motives and/or simply a lack of correct science. It can be difficult to tell whether a disputed measure is the result of differing sciences or uninformed 'science', and it is also unclear how to regulate situations in which different interpretations were drawn from the same science.

Having thus illustrated the need for normative guidance for science, the question arises of what kind of benchmark should be used to determine such a normative guidance. One might turn to international standards, where available, as these are negotiated at global level and are based on scientific evidence.[609] This would be in accordance with Article 3.1 of the SPS Agreement.[610] However, the idea that science is sound and that international standards are based on 'sound science' has been disputed.

First of all, several scholars have argued that science in general is not as objective as it may appear to be[611], and therefore should not be relied on to solve disputes.[612] For example, 'purely "scientific" representations of risks' have been criticized as regularly

[609] Codex Alimentarius Commission, *Codex and Science*. Accessed 5 March 2018, http://www.fao.org/fao-who-codexalimentarius/about-codex/science/en/.

[610] 'To harmonize sanitary and phytosanitary measures on as wide a basis as possible, Members shall base their sanitary or phytosanitary measures on international standards, guidelines or recommendations, where they exist, except as otherwise provided for in this Agreement, and in particular in paragraph 3.'

[611] Robert E. Hudec (2003), Science and 'Post-Discriminatory' WTO Law. *Boston College International and Comparative Law Review* 26(2): 185-195, p. 188-189.

[612] Arcuri, above n. 115, p. 1.

being a mix of science and politics[613] since always some 'subjective professional judgment' is applied in interpreting science.[614] It has been observed that non-scientific assumptions influence the scope of risk assessments[615] and the selection and interpretation of evidence.[616] Additionally, differing conclusions on risk may be drawn not simply as a result of differing interpretations of science, but due to different questions being asked[617] and different value-choices in scientific studies.[618]

If science is not 'pure' and always has some sort of bias, then international standards and guidelines may be 'imbued with social preferences'[619] and may not represent 'the only conceivable approach to risk assessment'.[620] It is therefore not 'honest'[621] to assume that they are better than the regulations of domestic countries. Arcuri (2014) showed with the case of ractopamine how this may cause problems: 'Two scientific panels reached different conclusions on the safety of a certain substance. The Panels are both institutional bodies, composed of arguably well-established "regulatory scientists". Arguing that following JECFA recommendations is sound science and all the rest is not means disqualifying EFSA science as unsound.'[622]

Taking all this into account, science as it is currently regulated by the WTO is insufficient. The development of international standards could be advanced to restrain the extraterritorial effect of measures.

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[613] Erik Millstone (2009). Science, Risk and Governance: Radical Theories and the Realities of Reform in Food Safety Governance. *Research Policy* 38: 624-636.

[614] Goh, above n. 258, p. 668.

[615] Helge Torgersen & Franz Seifert (2000), Austria: Precautionary Blockage of Agricultural Biotechnology. *Journal of Risk Research* 3(3): 209–217.

[616] Sheila Jasanoff & Brian Wynne (1998), *Science and Decision-Making*. In Steven Rayner, Elizabeth L. Malone (Eds.), *Human Choice and Climate Change: An International Assessment*. Vol. 1 The Societal Framework. Battelle Press.

[617] Erik Millstone, Patrick van Zwanenberg, Claire Marris, Les Levidow & Helge Torgersen (2004), Science in Trade Disputes Related to Potential Risks: Comparative Case Studies. *European Science and Technology Observatory*, Institute for Prospective Technological Studies, Seville.

[618] Arcuri, above n. 115, p. 10.

[619] Van Zwanenberg et al., above n. 542, p. 39.

[620] Ibid., p. 39.

[621] Arcuri, above n. 115, p. 7.

[622] Ibid., p. 9.

6.2.3 Research question 3: How do international regulatory standards impact the extraterritorial effect of SPS measures?

In order to study the influence of international regulatory standards on the extraterritorial effect of SPS measures, this dissertation looked into how they are used in Article 5.6 SPS disputes and what role they may serve in challenging extraterritorial measures not based on science. This dissertation shows that standards of international organizations have the potential to limit the extraterritorial effect of SPS measures. Chapter 4 found that standards of the international organizations endorsed by the SPS Agreement were used very successfully as a 'sword' to show that a challenged measure was more trade restrictive than necessary. Chapter 5 found that international organizations beyond the WTO have the potential to be used as a sword when challenging measures without a scientific basis.

Chapter 4 showed that the type of proposed alternative measure has a major influence on whether a violation of Article 5.6 is determined. Alternative measures based on a standard written by one of the three SPS-endorsed standard-setting organisations (Codex, OIE, IPPC) were regularly regarded as achieving a defending country's ALOP (except when the ALOP was explicitly defined as higher than that of an international standard), resulting in an Article 5.6 violation. In contrast, it was more difficult to prove a proposed measure based on scientific evidence would meet the requirements, perhaps due to the 'shielding' properties of the weak interpretation of science, as shown in Chapter 3. In this case, measures with an extraterritorial effect (and national regulatory autonomy in general) were at least indirectly limited by the power of standards of international organizations.

In the vegetable seed sector there are no major dominant regulators that are able to set global standards through their extraterritorial effect of measures. Domestic phytosanitary standards for vegetable seeds often vary widely and are not based on scientific evidence. The main reason for these 'unnecessarily strict' measures—besides protectionism—is that there is a lack of adequate science on which to base phytosanitary measures. The lack of adequate scientific data is also one of the main difficulties in determining and challenging potentially protectionist measures.

The SPS Agreement recognizes the IPPC as the international standard-setting organization for plant health standards. The IPPC's International Standards for Phytosanitary Measures (ISPMs), however, are more broad guidelines for national

phytosanitary standards, and specific phytosanitary issues are not addressed. It can therefore be difficult to argue in the WTO DSB that Members' measures are in violation of the SPS Agreement: Chapter 4 showed that measures based on scientific evidence, rather than international standards, are difficult to prove.

Another international organization, the International Seed Federation (ISF), is working on a Regulated Pest List Initiative, a database developed by experts in the field that covers which pests should be regulated for which crops, and which treatment and testing methods are necessary. Its aim is not necessarily harmonization but to be used as a resource for national legislation. It would also have value in challenging measures not based on science, although its status within the WTO dispute settlement system is unclear since ISF is not specifically endorsed by the WTO, and it is not known to what extent national governments comply with its recommendations. Nevertheless, if it becomes more widely adopted and recognized, its guidelines have the potential to be used as a sword to fight the extraterritorial effect of measures.

Bradford (2012) identified three external constraints specifically in the context of the 'Brussels Effect': markets, other states and international institutions such as the WTO.[623] This research found international standards to be a particularly powerful restraint for the extraterritorial effect of measures.

Despite this claim, the extraterritorial effect was not always constrained in this study, i.e. in Chapters 2 and 3. There were some relevant Codex standards for hormones in beef in the *EC-Hormones* dispute. In this case the EU refused to comply with the DSB ruling and instead accepted retaliatory measures from the US and Canada. However, in other cases there were no relevant international standards. For example, the fungus that causes citrus black spot disease in the dispute between the EU and South Africa is a phytosanitary issue; Chapter 5, although with the example of vegetable seeds, showed that there is a need for further international standardization in the phytosanitary sector. This demonstrated the importance of expert-developed guidelines in a sector dealing with scientific uncertainty and protectionism.

If countries would take a step further and align their domestic regulations with international standards, there would be fewer barriers to trade. This additionally offers greater transparency, as harmonized measures and those based on international standards make it easier to distinguish between measures with a legitimate scientific

[623] Bradford, above n. 1.

justification and those without. 'Of course, to the extent that harmonization is realized, this will not ipso facto entail that all regulatory unilateralism will be ruled out and that no more disputes will arise. For instance, even if international harmonization is realized, the SPS Agreement expressly authorizes Members to maintain higher standards (linked to a set of appropriate conditions)'[624] Nevertheless, international standards can be used as a 'sword' to challenge measures with an extraterritorial effect.

6.3 Synthesis of the research: In what ways does WTO law prevent or enable the extraterritorial effect of domestic sanitary and phytosanitary (SPS) measures?

Chapters 2-5 taken together provide a mixed view of whether WTO law acts as a sword or shield for the extraterritorial effect of domestic SPS measures. This dissertation found instances of how the law is used both to limit and facilitate the effect. The following overview is a summary of the findings of the research chapters.

Use of SPS laws as a shield to enable the extraterritorial effect of measures

Chapter 2 demonstrated that even when the WTO rules against a dominant country in a dispute, its influence on the extraterritorial effect *in action* is limited. It was possible for countries to modify their measures to be in compliance with WTO law, but still have an extraterritorial effect. Chapter 3 observed that the lack of normative definitions of science and risk allow market forces to take over and bigger trading blocs to impose their interpretations of science on weaker trading partners. It also noted that the uncertainty regarding how science should be interpreted can be used as a shield for protectionist and/or extraterritorial measures, by designing such measures shielded as a scientific necessity. Chapter 5 showed that the lack of harmonization and shortage of standards for acquiring and interpreting scientific data on phytosanitary issues for vegetable seeds can provide a leeway for countries to introduce protectionist measures.

Use of SPS laws as a sword to challenge the extraterritorial effect of measures

[624] Geert van Calster (2008), Against Harmonization – Regulatory Competition in Climate Change Law. *Carbon and Climate Law Review* 2(1): 89-94, p. 93.

Chapter 4 found that the standards of international organizations can limit the extraterritorial effect. Proposed alternative measures based on international standards were most likely to be accepted as valid alternative measures. In addition, Article 5.6 was observed to be a pure trade liberalization article; SPS measures may be ruled in violation of WTO law solely for being excessively trade restrictive. Chapter 5 showed the value of international standards and guidelines in challenging protectionist measures and/or those without a scientific basis.

In summary, this dissertation found that the uncertainties and different interpretations of science are the main 'shield', and international standards are the main 'sword' for the extraterritorial effect of SPS measures. Although the extraterritorial effect has the potential to be—and in some instances is—limited by international standards, it still often persists, perhaps due to the lack of a normative standard for science. This is discussed further in Section 6.5: Policy implications and recommendations.

6.4 Limitations of the research

The main limitations of this research stem from the fact that findings were drawn from specific situations in the chapters, and can therefore not always be generalized.

First of all, the focus on the SPS Agreement as a case study of WTO rules on the extraterritorial effect of measures does not necessarily apply to other areas of WTO law. It was observed that science can be used as a 'shield' and international standards can be a powerful 'sword', but these specific SPS elements are irrelevant in most other sectors.

In Chapters 2 and 3, the analysis was based on only three and one dispute(s), respectively. Conclusions on the extraterritorial effect and its relationship with WTO rules cannot necessarily be extrapolated from this relatively small sample. This is additionally due to the fact that interpretations of WTO rules by the DSB are 'formally authoritative for the dispute being decided, not for others.'[625] The case study in Chapter 3 was compared with previous WTO disputes in order to understand what kind of logic the DSB might apply in such a case. However, '(t)he decision as to whether a case is sufficiently similar to another is ultimately a subjective one as no two cases are ever

[625] Van Damme, above n. 70, p. 610.

completely identical.'[626] It may not always be possible to extrapolate the results to other disputes, perhaps because the case may be too specific or because it is unknown if the result is due to the application of the SPS Agreement or the legal strategy of a jurisdiction.[627]

In addition, there was sometimes a narrow focus of the research. For example, in Chapter 4, only Article 5.6 of the SPS Agreement was analysed. This was, however, to enable an extensive analysis of one provision, rather than a superficial analysis of multiple provisions. In Chapter 5 it would have been valuable to know the compliance rates with the harmonization schemes or the extent to which they have been adopted. These indicators are not readily available, however, and are perhaps an area for future research.

This dissertation is on the impact of WTO rules, so naturally, trade dispute proceedings were a major part of the analysis. Chapters 2-4 in particular were focused on WTO disputes. Due to the challenges, effort and resources required to launch a dispute with the WTO, countries are likely to do so only when they expect a positive outcome. In addition, countries may be hesitant or avoid bringing a case to the WTO if they for example wish to limit further tensions or evade media attention on a particular topic.[628] There are likely many instances of the extraterritorial effect that have not been reported in the WTO dispute settlement system. The focus of trade disputes as a source of information may therefore be a skewed representation and it is acknowledged that there is likely much beyond the scope of this dissertation.

6.5 Policy implications and recommendations

This dissertation found international science-based standards, guidelines and recommendations to be a powerful tool in limiting the extraterritorial effect of SPS measures. It did identify a need for further standards, guidelines and recommendations at multilateral level since there are currently many gaps in their coverage. It is important, however, to not give international standards a 'taken-for-granted status' so that they are 'no longer open to questioning'.[629] The WTO should regulate international

[626] Paul Chynoweth (2008), *Legal Research*. In Andrew Knight and Les Ruddock (Eds.), *Advanced Research Methods in the Built Environment*. Blackwell Publishing, p. 28-38, p. 33.
[627] Downes, above n. 97, p. 110-111.
[628] Pollack & Shaffer, above n. 46, p. 179.
[629] Jansen, above n. 543.

standard-setting bodies to ensure that international standards themselves are not biased. It is therefore essential to frame the composition of these organizations to sure they are impartial. The Committee on Technical Barriers to Trade set out guidelines on the development of international standards, guidelines and recommendations 'to ensure transparency, openness, impartiality and consensus, effectiveness and relevance, coherence, and to address the concerns of developing countries.'[630] This document, while still vague, could be used as a baseline to govern how these organizations should operate to ensure that all interested countries contribute and all views are taken into account.[631]

Of course, even if there are more international science-based standards, guidelines and recommendations, WTO Members still have the right to enact more stringent domestic regulatory measures. In situations with two sound scientific evaluations, or one undisputed scientific evaluation but with different interpretations, it is likely that disputes will continue to arise regarding whose science and interpretations are correct. For such situations the WTO should develop a defined normative standard for science. Without guidance from the WTO, it is possible for countries to impose their—not necessarily better—interpretations on their trading partners.

This dissertation found further instances of uncertainties in the application of SPS law for which it is recommended that the WTO provide normative clarity. It would be valuable to elaborate on what is considered to be a *rational* relationship between risk assessment and SPS measures, and similarly what *sufficiently supported* and *reasonably warranted*[632] imply. There is additionally a grey area regarding what *significantly* less trade restrictive in Article 5.6 means; it is recommended that the WTO elaborate on what is meant specifically by *significantly*. In addition, it was found that when examining the *reasonable availability* requirement of a potential alternative measure, the Panel and Appellate Body focused on only the possibility, and not the reasonability, of a measure. It could be evaluated in a more sound way, by focusing on for example the benefit achieved by the regulatory measure or trade gains.

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[630] Committee on Technical Barriers to Trade (2015), Decisions and Recommendations Adopted by the Committee on Technical Barriers to Trade Since 1 January 1995. G/TBT/1/Rev.12 (21 January 2015), p. 47.
[631] Ibid., p. 58. For a discussion of the development and application of technical standards specifically in the EU and US, see Kai Purnhagen (2018), *Who Recognises Technical Standards in TTIP*? In Elaine Fahey (Ed.), *Institutionalisation Beyond the Nation State. Transatlantic Relations: Data, Privacy and Trade Law.* Springer International Publication.
[632] Appellate Body Report, EC – Hormones, above n. 250, paras. 186.

Such clarifications are an opportunity for change. The proposal for the WTO to develop a more normative standard to be used for the interpretation of science is not a minor task. The outcome will have a major impact on human, animal and plant life and health around the world, and should not be taken lightly.

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7.2 Legislation & Case Law

7.2.1 WTO

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7.2.2 EU

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7.2.3 United States

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7.2.4 South Africa

Agricultural Product Standards Act, No. 119 of 1990

Summary

Domestic regulatory standards can migrate to other jurisdictions via trade. This 'extraterritorial effect' has been most frequently demonstrated with the exportation of the typically more stringent European Union (EU) regulations to other countries. The EU's trading partners often involuntarily 'trade up' and adopt EU regulations in order to access its market. The extraterritorial effect is subject to the rules of the World Trade Organization (WTO). It has been argued that the WTO can constrain this extraterritorial effect primarily through the enforcement of its rules in the dispute settlement system. However, scholars have argued that WTO rules can in fact shield the extraterritorial effect against retaliation and cannot easily declare extraterritorial measures as incompliant if they are not discriminatory. These characterizations of WTO law are arguably simplified and do not address the technicalities of WTO law. This dissertation therefore examined WTO rules on the extraterritorial effect of measures in a technical, nuanced manner by systemically analysing provisions and applications of WTO law. The focus of the analysis is on the understudied area of sanitary and phytosanitary (SPS) measures.

The central research question this dissertation answers is: In what ways does WTO law constrain or enable the extraterritorial effect of domestic sanitary and phytosanitary (SPS) measures? The three sub-questions to address this question are: 1) How does the extraterritorial effect of SPS measures impact trade partners in practice?, 2) How is SPS law applied and interpreted as a 'sword' or 'shield' by the WTO Dispute Settlement Body (DSB)?, and 3) How do international regulatory standards influence the extraterritorial effect of SPS measures? Since the focus of this dissertation is based upon the knowledge gap of the simplified conceptualizations of WTO law on the extraterritorial effect of measures, and hence on a question concerning primarily the internal analysis of law, the methodology applied is legal doctrinal research. Such an approach allowed for a thorough examination of the relevant WTO and domestic rules, as well as how they are applied and interpreted in jurisprudence. The doctrinal analysis was expanded to include research from other disciplines in order to enrich the analysis. The dissertation is based upon four articles, as follows:

Chapter 2: Reversed harmonization or horizontalization of EU standards?: Does WTO law facilitate or constrain the Brussels Effect? (published in the Wisconsin International Law Journal)

Chapter 2 investigates if the extraterritorial effect can be found in the food sector and what the influence of the WTO is even after dispute settlement rulings. To conduct this

research three trade disputes were analysed: genetically modified organisms (GMOs), Hormones and Dolphin-Tuna. The extraterritorial effect was found in all disputes. Although the DSB did rule against the extraterritorial measures, it was observed to have limited impact in action. In the case of GMOs, the DSB ruled in favour of the US, Canada and Argentina and declared the EU's *de facto* moratorium and member state bans incompliant with WTO rules. However, this had little impact on the EU regulations for and market for GMOs. In the Hormones dispute, the EU refused to comply with the DSB's ruling to accept beef treated with certain hormones, and instead accepted retaliatory tariffs from the US and Canada, which it was well within its rights to do. Lastly, in the Dolphin-Tuna dispute, the US modified its challenged regulations so that they were no longer discriminatory, but they still had an extraterritorial effect on Mexico and other countries that exported tuna to the US. This chapter showed that although the black-letter of the WTO rulings aimed to constrain the extraterritorial effect of measures, it was unable to do so in practice.

Chapter 3: When life gives you lemons: The "battle of science" on the correct interpretation of data on citrus black spot disease between the European Union and South Africa according to the SPS Agreement (published in Trade, Law and Development)

SPS measures must be based on science; this requirement has been extensively analysed and debated by scholars. Despite this scrutiny many questions remain regarding what kind of scientific evidence is required to justify a measure and how science should be interpreted. In some situations this results in a 'battle of science', in which the scientific data are not disputed but differing conclusions are drawn on the level of risk posed and the measures that should be taken. Chapter 3 showed with the example of the dispute on citrus black spot disease between the EU and South Africa that this uncertainty can be used by dominant countries to impose their standards on trading partners. South Africa had to factually adapt to EU regulations, even though it disagreed with them, just to maintain access to its lucrative market. An investigation into existing WTO jurisprudence found only limited interpretation that can provide a benchmark for how the science-based requirement must be construed: SPS measures must establish the probability, not only the possibility, that an identified risk will occur.

Chapter 4: The potency of the SPS Agreement's 'excessivity test': The impact of Article 5.6 on trade liberalization and the regulatory power of WTO members to take sanitary and phytosanitary measures (published in the Journal of International Economic Law)

Article 5.6 SPS stipulates that SPS measures must not be more trade restrictive than required to achieve a Member's appropriate level of protection (ALOP). A measure may be declared in violation of Article 5.6 if an alternative measure exists that is reasonably available, meets the Member's ALOP and is significantly less restrictive to trade. In Chapter 4 all trade disputes that invoked the provision were systematically analyzed using qualitative analysis software (Atlas.ti). Article 5.6 was found to be a powerful tool in challenging SPS measures for being excessively trade restrictive, and its importance has increased over time. It was additionally observed that alternative measures based on international standards were most likely to demonstrate a violation of the provision.

Chapter 5: The role of international organizations in the harmonization of phytosanitary standards for vegetable seeds (under review)

Most countries around the world have adopted phytosanitary regulations for (imported) vegetable seeds in order to control the pests and diseases that may be potentially introduced through trade. Standards diverge widely and pose a challenge for exporters that need to meet varying import requirements. Additionally, many of these domestic phytosanitary measures are not based on science. Although it is not technically or politically feasible to fully harmonize phytosanitary standards for vegetable seeds, the logic used to develop them should be further standardized. This chapter examined relevant international organizations and their harmonization schemes to understand what, if any, role they may serve in reducing barriers to trade in this sector. It was found that certain science-based guidelines do have the potential to aid in challenging unjustified phytosanitary measures, although the feasibility in doing so is still unknown.

This dissertation concludes with answers to the research questions and a synthesis of the entire dissertation. Limitations and policy implications are also addressed. It was observed that the extraterritorial effect does occur in the SPS sector, and its scope is broader than originally thought, i.e. both developed and developing countries enact measures with an extraterritorial effect. This research found that WTO laws both constrain and facilitate the extraterritorial effect of measures. The uncertainty surrounding the science requirement is used as the main 'shield' for extraterritorial measures and international standards are the main 'sword' for challenging such measures. It is recommended that further science-based international standards, guidelines and recommendations be developed as they were found to be a powerful tool in challenging measures with an extraterritorial effect. The WTO should regulate the

organizations that set these standards to ensure that they are impartial. Additionally, it concludes that the WTO should develop a normative standard for science in the SPS Agreement in order to limit the use of extraterritorial measures shielded as a scientific necessity.

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About the author

Dominique Sinopoli was born on 5 May 1989 in Syracuse, New York, United States. She received a BSc in Food Science (with distinction in research) from Cornell University and an MSc in Food Safety (cum laude) from Wageningen University. In 2014 she began her PhD with the Law and Governance Group at Wageningen University. She was also employed as a lecturer and contributed to several courses in the field of food law. During her time as a PhD candidate she went on research visits at the University of Cape Town, University of Pretoria and European University Institute.

List of publications

Hanna Schebesta & Dominique Sinopoli (2018), The Potency of the SPS Agreement's Excessivity Test: The Impact of Article 5.6 on Trade Liberalization and the Regulatory Power of WTO Members to Take Sanitary and Phytosanitary Measures. *Journal of International Economic Law* 21(1): 123-149.

Dominique Sinopoli & Kai Purnhagen (2017), When Life Gives you Lemons: The "Battle of Science" on the Correct Interpretation of Data on Citrus Black Spot Disease Between the European Union and South Africa According to the SPS Agreement. *Trade, Law and Development* 8(1): 29-62.

Dominique Sinopoli & Kai Purnhagen (2016), Reversed Harmonization or Horizontalization of EU Standards? Does WTO Law Facilitate or Constrain the Brussels Effect? *Wisconsin Journal of International Law* 34(1): 92-119.

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Dominique Sinopoli, Jaap Kluihooft and Bernd van der Meulen (2014), Authorisation Requirements. Chapter in *EU Food Law Handbook* by Bernd van der Meulen. Wageningen Academic Publishers.

Dominique A. Sinopoli and Harry T. Lawless (2012). The taste properties of potassium chloride alone and in mixtures with sodium chloride using a check-all-that-apply method. *Journal of Food Science*, 77(9): S319-S322

Harry T. Lawless, Dominique Sinopoli and Kathryn W. Chapman (2010). A comparison of the labeled affective magnitude scale and the 9-point hedonic scale and examination of categorical behavior. *Journal of Sensory Studies*, 25:54-66.

Dominique Sinopoli
Wageningen School of Social Sciences (WASS)
Completed Training and Supervision Plan

Name of the learning activity	Department/Institute	Year	ECTS*
A) Project related competences			
Writing PhD proposal	LAW	2014	6
Research visit	University of Cape Town (South Africa)	2015	3
Research visit	University of Pretoria (South Africa)	2015	3
PRAIA International Trade Law Academy	Peking University Shenzhen Graduate School (China)	2016	2.5
Presentation: 'When life gives you lemons: The dispute on the correct interpretation of data on citrus black spot disease between the European Union and South Africa'	PEPA/SIEL conference, Tilburg Law and Economics Center	2017	1
Research visit	European University Institute (Italy)	2017	2
Writing retreat	Wageningen Centre of Sustainability Governance	2017	0.5
Presentation: 'The feasibility and role of international organizations in harmonization of phytosanitary standards for seeds'	Wageningen Centre of Sustainability Governance	2017	1
B) General research related competences			
Introduction course	WASS	2014	1
Instrumentalizing private standards for small-scale farmers' inclusion	University of Pretoria (South Africa)	2014	1
Intellectual Property Rights	LAW	2015	2
Qualitative Data Analysis with Atlas.ti	WASS	2016	1
Principles of a Global One Health	WASS	2016	1

Origin Food: A Market for Identity	RSO	2017	2.5
C) Career related competences/personal development			
Lecturing	LAW	2014-17	1
Lecturing course	ESD	2014	1
Led excursions to Brussels and Geneva	LAW	2014-16	1
MSc thesis supervision	LAW	2016-17	1
PhD workshop carousel	WGS	2017	0.3
Total			31.8

*One credit according to ECTS is on average equivalent to 28 hours of study load

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