City Research Online

City St George's, University of London

Citation: Collins, D. A. (2009). Health Protection at the World Trade Organization: The J-Value as a Universal Standard for Reasonableness of Regulatory Precautions. JOURNAL OF WORLD TRADE, 43(Issue 5), pp. 1071-1091. doi: 10.54648/trad2009042

This is the accepted version of the paper.

This version of the publication may differ from the final published version. To cite this item please consult the publisher's version.

Permanent repository link: https://openaccess.city.ac.uk/id/eprint/6616/

Link to published version: https://doi.org/10.54648/trad2009042

Copyright and Reuse: Copyright and Moral Rights remain with the author(s) and/or copyright holders. Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge, unless otherwise indicated, provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way. For full details of reuse please refer to City Research Online policy.

City Research Online: http://openaccess.city.ac.uk/ publications@citystgeorges.ac.uk

Health Protection at the World Trade Organization - The J-Value as a Universal Standard for Reasonableness of Regulatory Precautions

This article was published in 43:5 Journal of World Trade 1071-1091

by David Collins*

ABSTRACT:

Article XXb of the General Agreement on Tariffs and Trade (GATT) and the Sanitary and Phytosanitary (SPS) Agreement prohibit health safety measures which are unreasonable restrictions on trade, which WTO case law has shown to mean not based upon sound scientific principles or international consensus. However the existing difficulty in ensuring uniformity in these criteria as implemented by the WTO Dispute Settlement Body (DSB) necessitates resort to a universal scale for assessing the legitimacy of health and safety precautions by reference to an objective cost benefit analysis. This paper attempts to apply the J-Value scale, developed in the United Kingdom to gauge expenditures in industrial risk prevention, to evaluate the reasonableness of WTO member state product safety regulations in a readily quantifiable, judicially instructive manner. The J-Value can be implemented by WTO panels *ex post* as well as government regulators *ex ante* in order to assess whether or not a specific measure aimed at ensuring human health and safety is actually an unnecessary barrier to international trade. In keeping with WTO principles, key features of the J-Value formula allow for different tolerances towards health risks depending on the view of the Member states which implement them, based on factors such as life expectancy and Gross Domestic Product (GDP).

I Introduction

There is now a substantial body of commentary on the important fields of health regulation at the World Trade Organization ('WTO'), primarily in relation to the

* Lecturer, City Law School, City University, London <david.collins@utoronto.ca> The author would like to thank Professor Philip Thomas of the School of Engineering and Mathematical Sciences of City University London and Professor Michael Trebilcock of the University of Toronto Faculty of Law for helpful comments. This research was supported by a grant from the Centre of Innovation and Knowledge Transfer of City University London.

Electronic copy available at: http://ssrn.com/abstract=1552945

Agreement on Sanitary and Phytosanitary Measures ('SPS Agreement') which has called for improved methodology with respect to the Dispute Settlement Body's ('DSB') ambiguous and largely unworkable approach to the risk regulation by Member States. In the words of two commentators: "the WTO lacks a consistent, principled manner in which to take account the scientific uncertainty underlying [environmental] policy objectives."[1] The SPS Agreement specifically has been criticized for invoking standards which are so loose that it is essentially unworkable.[2] This has led to requests for "an explicit, principled basis ... to provide consistency and predictability"[3] in the review of domestic risk assessment strategies. While much of the scholarly debate on these issues is invaluable and some of it referenced herein, there has been no attempt by any WTO scholars to substitute an enhanced mechanism for gauging the reasonableness of regulatory risk assessment that could be implemented either by Member state governments *ex ante* or by the DSB *ex post* in establishing conformity or lack thereof with WTO obligations concerning health measures. This article provides the most substantive, practical means of reform to the WTO's regulation of health protection by adapting an established mathematical formula, the J-Value, which has already been used to assess the reasonableness of expenditure in health / safety precautions in industry, to the text of the General Agreement on Tariffs and Trade ('GATT') General Exceptions as well as the SPS Agreement. Drawing upon the implicit connection between efficiency (as derived through the formula's simple yet sophisticated form of cost-benefit analysis) and reasonableness, the J-Value is presented as a highly useful standard for determining the legitimacy of health measures in terms of social welfare which have deleterious

[1] Andrew Green and Tracey Epps, "The WTO, Science and the Environment: Moving Towards Consistency" 10 JIEL 285 at 286
[2] Joanne Scott, *The WTO Agreement on Sanitary and Phytosanitary Measures: A Commentary* (OUP, 2007) at 44.
[3] Ilona Cheyne, "Risk and Precaution in World Trade Organization Law" 40(5) JWT 837 at 864.

Electronic copy available at: http://ssrn.com/abstract=1552945

effects on international trade. Because the formula draws upon the scientific evidence that is offered by each Member state and acknowledges regional differences in quality of life it is responsive to regulatory sovereignty while fostering international consensus in the levels of health protection that should be pursued. An improved methodology for evaluating the reasonableness of health safety measures may not only be beneficial at the level of WTO dispute settlement but we should expect that augmented procedural requirements necessary to conform to the J-Value standard may also have a positive effect on administrative decisions at the domestic level that do not have an effect on international trade, including greater transparency and accountability.[4]

This article will begin by contextualizing the J-Value formula for health expenditure within the existing commentary on cost-benefit analysis as a tool of legal reasoning. The current legal regime for the regulation of health protection measures at the WTO - the General Exceptions under Article XX b) and the SPS Agreement will be briefly outlined with reference to some of the case law in this area in Part Two. Part Three will explain in a systemic fashion precisely how the J-Value works, describing how each of its variables is derived as well as some of the associated difficulties in quantifying various values. Part Four will expand upon the relevance of the J-Value to the sphere of international trade, concluding with a hypothetical example of a trade measure and its associated effects upon health in order to substantiate the functionality of the formula through actual numeric values. The importance of the J-Value will be emphasized in Part Four which evaluates the need for efficiency in the administrative regulation of health concerns by reference to the specific WTO provisions for which it offers guidance. The conclusion will highlight

[4] Green and Epps "The WTO, Science" at 287.

the usefulness of the formula while acknowledging certain drawbacks, namely the uncertain linkage between economic cost and human safety. The application of the J-Value formula to the WTO's Agreement on Technical Barriers to Trade ('TBT Agreement') will not be covered by this article as this instrument deals with product standards of a more general nature and does not encompass human health measures directly, which the J-Value was purposely designed to address.

II Health and Safety Measures at the WTO

i) GATT XX b) Exception for the Protection of Human Life and Health

The GATT provides some room for Member states to promote other policies in conjunction with their WTO obligation to liberalize trade. One of the primary instruments for this vital aspect of states' sovereignty is the set of General Exceptions contained in Article XX. For our purposes, the most important component of this article is subsection b) which permits measures which are "necessary to protect human, animal or plant life or health". The ability of a Member state to pursue a policy with this objective in mind is restrained by the chapeau to Article XX which requires that such a measure not be "applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries ... or [be] a disguised restriction on international trade".

Although the text of the article itself does not make reference to science, case law has shown that measures which are purportedly justified under XX b) as "necessary" should be founded upon scientific evidence. However, there is very limited guidance as to what will suffice as scientific evidence regarding the existence of a risk to health. The Appellate Body concluded in *EC - Asbestos* that a Member

may rely on scientific sources which diverge from qualified and respected opinion.[5] The risk to human health which the measure is intended to address need not be quantified but may be evaluated in qualitative terms[6]. In *US-Shrimp* the Appellate Body further ruled that the nation imposing an environmental measure must make a good faith effort to engage in negotiations with other nations, which demonstrates the dispute settlement body's primary focus on procedural requirements rather than substantive, evidentiary ones, such as the quality of the science informing the regulation in question.[7]

To date the Article XX b) exception has been invoked in three highly controversial WTO cases: *US- Gasoline*[8] (wherein a US law that required certain gasoline to burn cleaner was not permitted by the panel); *EC-Asbestos*[9] (wherein a French law prohibiting asbestos products was upheld by the Appellate Body as necessary to protect human health); and *EC- Tariff Preferences* (wherein tariff preferences granted by the EC to countries experiencing drug trafficking problems were held not to fall within the scope of the XX b) exception following a modification by the Appellate Body).[10] A number of Lesser Developed Countries ('LDCs') have argued that Article XX has been abused by nations such as the United States as a means of disguised protectionism through the requirement of unjustifiably high standards which are difficult for exporters in impoverished nations to fulfil because of inferior resources. The sharing of technical expertise with respect to health risk identification and management, as an important component of international harmonization of standards, could help address this concern.

---

[5] EC Asbestos [178]
[6] Asbestos [167]
[7] Green and Epps "The WTO, Science..." at 299
[8] US - Standards for Reformulated and Conventional Gasoline WT/DS2/AB/R
[9] EC - Measures Affecting Asbestos and Asbestos-Containing Products, WT/DS135/AB/R
[10] EC- Conditions for the Granting of Tariff Preferences to Developing Countries, WT/DS246AB/R

The functionality of the GATT Article XX b) exception and the article's chapeau, which was designed to prevent abuse of the exceptions for protectionist measures, rests upon the ambiguity of the concepts of arbitrary and unjustifiable, which in turn hinge on the veracity of scientific evidence. It will be suggested below that an objective, numerically quantifiable formula such as the J-Value can be used to facilitate the interpretation of these important qualifying terms.

ii) Agreement on the Application of Sanitary and Phytosanitary Measures ('SPS Agreement')

The SPS Agreement is narrower in scope than GATT Article XX covering only measures that are related to human, animal and plant life or health. In that sense the SPS Agreement is in many ways an extension of the GATT XX b) exception. However, the SPS's application is not contingent on a prior breach of the GATT. Article 2.4 of the SPS states that sanitary or phytosanitary measures which conform to the SPS Agreement shall be presumed to be in accordance with the obligations of Members under the GATT Article XX b). There have been five WTO disputes in which the SPS Agreement has been interpreted, *Australia - Salmon*[11], *Japan - Agricultural Products II*[12], *Japan-Apples*[13] and *EC- Approval and Marketing of Biotech Products*[14] and *EC-Hormones*.[15] In all of these cases the Member imposing the SPS measure was determined to have violated some aspect of their SPS Agreement obligations. While the agreement itself is relatively narrow in scope, recent WTO jurisprudence has shown that the SPS may have a wide-ranging application including measures aimed at addressing risks that may arise indirectly or

[11] Australia - Measures Affecting Importation of Salmon - AB Report WT/DS18/AB/R
[12] Japan - Measures Affecting Agricultural Products II, WT/DS76/AB/R
[13] Japan - Measures Affecting the Importation of Apples, WT/DS245/AB/R
[14] EC - Approval and Marketing of Biotech Products, panel report WT/DS291/R
[15] EC-Measures Concerning Meat and Meat Products - AB Report WT/DSD26/AB/R

in the long term.[16] Annex A of the SPS Agreement establishes that sanitary and phytosanitary measures involve those which are aimed at protecting human, animal or plant life from disease, contaminants, toxins and pests. Only measures which have one of these purposes will be subject to scrutiny under the SPS Agreement. Article 2.2 requires that SPS measures are applied only to the extent necessary to protect human, animal or plant life or health, a restriction which is very similar to GATT Article XX b), except that unlike Article XX b) which operates as a defence, Article 2.2 of the SPS is a general obligation that applies to all SPS-related measures. For the purposes of the J-Value which is the focus of this article, only those measures which affect human health will be considered herein.

Article 2.2 importantly provides that the measures must be based upon "scientific principles". This requirement has been a source of significant controversy in large part because of the perceived fallibility of science as a means of understanding and controlling risk. Mindful of this concern, the Appellate Body in *EC Hormones* insisted upon the right of Member states to determine the level of protection which they feel is appropriate. The Appellate Body affirmed that Members have an autonomous right to determine the appropriate level of SPS protection in *Japan- Varietals*[17]. While there is no indication that the dispute settlement bodies will second-guess a stated level of protection, the means to achieve it will rightly be the subject of scrutiny under the agreement and measures which are viewed as disproportionate in terms of their trade-related effects will be disallowed. Still, the SPS's devotion to science has been derided because for its ignorance of both the cultural component of risk (that certain groups are more willing to tolerate certain

[16] Panel EC Biotech par 7.226, see Jacqueline Peel, "A GMO By Any Other Name...Might Be an SPS Risk: Implications of Expanding the Scope of the WTO Sanitary and Phytosanitary Measures Agreement" 17 EJIL 1009 (2006)
[17] at [194].

types of risks than others) as well as the significance of irrational fears in people's lives which are not necessarily demonstrated by statistical evidence.[18] Such concerns are within the realm of popular opinion, which is typically irrelevant to the question of scientific validity but which some scholars hold to be an essential component in regulatory risk assessment.[19] This latter view has led to what Fisher has described as the SPS's clash between democracy and science - that the will of the electorate and their personal concerns about various health risks should inform regulatory measures, not laboratory testing[20]. We will return to this debate in Section VI.

Related to the requirement of scientific justification through risk assessment, Article 3.1 outlines that Members shall base their sanitary and phytosanitary measures on international standards and guidelines in an attempt to promote harmonization of health standards worldwide through the adoption of the same or similar policies of health protection. Three standard setting bodies are specified, only one of which has direct relevance to human health: The Codex Alimentarius Commission for food safety[21]. Motaal has criticized the authority granted to these agencies because of the highly politicized decision-making processes that occur both within these bodies and at the WTO which undermines the credibility of these bodies as truly embodying multilateral scientific consensus,[22] again suggesting that a more objective standard is required. Although the Appellate Body has been reluctant to acknowledge the

[18] See e.g. Joanne Scott, *The WTO Agreement on Sanitary and Phytosanitary Measures: A Commentary* (OUP, 2007) at 77-79, 150-151; Elizabeth Fisher, "Risk and Environmental Law: A Beginner's Guide" in Benjamin Richardson and Stepan Wood eds. *Environmental Law for Sustainability* (Hart 2006) at 99.

[19] Caroline E Foster, "Public Opinion and the Interpretation of the World Trade Organization's Agreement on Sanitary and Phytosanitary Measures" 11 JIEL 427; Tracey Epps, "Reconciling Public Opinion and WTO Rules Under the SPS Agreement" 7(2) World Trade Review 359 (2008).

[20] Elizabeth Fisher, "Beyond the Science/Democracy Dichotomy: The WTO Sanitary and Phytosanitary Agreement and Administrative Constitutionalism" in Christina Joerger and Ernst-Ulrich Petersmann eds. *Constitutionalism, Multilevel Trade Governance and Social Regulation* (Hart, 2006). .

[21] The other two are the World Organization for Animal Health and Epizootics (OIE) and the Secretariat of the International Plant Protection Convention. Either could conceivably affect human health indirectly. See Annex A par 3(a),(b) and (c) of the SPS Agreement.

[22] Doaa Abdel Motaal, "'The Multilateral Scientific Consensus' and the World Trade Organization" 38(5) JWT 855 at 864-866.

dominion of these listed agencies[23], under 3.2 of the SPS if such international standards are adhered to, then a health protection measure is presumptively valid under the SPS and the GATT. If not then it is up to the Member state to justify the measure under Article 3.3. Scott is critical of the SPS's emphasis on standardization which she depicts as "a methodological straightjacket operating in the name of false universalism and a naive conviction of there being right answers"[24]. While standardization may well promulgate false beliefs and erroneous science there is an undeniable economic justification, namely efficiency gains resulting from power sharing over a particular element of jurisdiction[25]. Member states which cannot afford to conduct expensive risk assessment may implement the standards derived from studies conducted by their wealthier trading partners. For the purposes of this article, the primary concern with international standard setting bodies, such as those listed in the SPS Agreement, is that they may set levels of health protection which are economically unwise, meaning that from a perspective of social welfare the resulting gains are less than the costs imposed.

Article 3.3 establishes that Members may implement SPS measures which result in a higher level of protection than that indicated by international standards, if there is some scientific basis. Perhaps most contentious of the provisions is Article 5.7 which condones the adoption of provisional measures on the basis of limited available data where insufficient information to be certain of the risks involved. The Appellate Body has stated that this section embodies the now notorious Precautionary Principle which establishes that a lack of reliable information on a certain risk justifies some level of regulation even if there is no evidence whatsoever of harm.

[23] Joanne Scott, "International Trade and Environmental Governance: Relating Rules (and Standards) in the EU and the WTO" 15 EJIL 307 (2004) at 310.
[24] Scott, *The WTO Agreement on SPS*, at 80
[25] Joel Trachtman, "Regulatory Jurisdiction and the WTO" 10 JIEL 631 at 648

However, the Appellate Body also cautioned that the Precautionary Principle could not override the provisions of the SPS and it intentionally avoided rendering a definitive judgment on the status of the Precautionary Principle in international law.[26] Scott and Motaal feel that this is an injunction against Member's hiding behind a mask of responsiveness to the unsubstantiated fears of a particular country.[27] Foster holds that Articles 5.5 and 5.6 which prohibit arbitrary or unjustifiable levels of protection permit Member states to take into consideration the public's views in the appreciation of the magnitude of risk as a means of fulfilling the basic principles of democracy as well as international human rights law.[28] The relevance of the cost of the precautions is expressly contemplated in Article 5.3 which establishes that in the conducting of risk assessment for the purposes of setting a particular sanitary or phytosanitary regulation, Members shall take into account economic factors including: "the potential damage in terms of loss of production or sales in the event of the entry, establishment or spread of a pest or disease; the cost of control or eradication in the territory of the importing Member; and the relative cost-effectiveness of alternative approaches to limiting risks". This sentence appears to embody an implicit calculus of the value of human life in economic terms of lost productivity due to illness or death.

Article 12.1 of the SPS establishes the Committee on Sanitary and Phytosanitary Measures ('SPS Committee') which is a forum for consultations between Member states regarding compliance with the SPS. The Committee also encourages the use of international standards by maintaining close contact with

[26] Hormones [123]. The Precautionary Principle was advocated again by the EU in EC-Biotech but its application was rejected by the Appellate Body because not all parties to the dispute had signed the Cartagena Protocol on biosafety which made reference to the Precautionary Principle. *European Communities — Measures Affecting the Approval and Marketing of Biotech Products* (2006), **WTO** Doc. WT/DS291/R, WT/DS292/R, WT/DS293/R (Panel Report) at para 7.75
[27] Scott at 151, Motaal, "Is The World Trade Organization Anti-Precaution?" 39(3) JWT 483 at 500
[28] Foster, JIEL.

international standard-setting associations[29]. The Committee must additionally undertake periodic reviews of the operation and implementation of the SPS[30]. The importance of the SPS Committee in the development of good practice in risk regulation and norm generation through an evaluation of standards produced by international organizations should not be understated.[31] Methods for assessing the reasonableness of regulatory precaution should be of significant interest to this body.

III Reasonableness of Precautions and the J-Value Scale

i) Cost Benefit Analysis

Law and Economics scholars have explored empirically based methods for resolving the ambiguity inherent in the common law's ubiquitous reliance on the concept of reasonableness as a means of injecting greater coherence to the exercise of judicial discretion. Posner notably suggested that the common law might be explained by reference to economic efficiency, meaning that benefits resulting from a certain legal rule were greater than costs.[32] The use of strict cost-benefit analysis as a tool in assessing the reasonableness of a safety precaution was seen perhaps most famously in Judge Learned Hand's equation from *United States v Carroll Towing Co*[33] wherein he stated that an injurer will be negligent if the burden of the precaution against harm (B) is less or equal to than the resulting benefit, which is a product of the magnitude of the injury (I) multiplied by the likelihood of it occurring (P): $B \leq IP$. Similar, less mathematically explicit methods of assessing the legitimacy of risk control have appeared in numerous pieces of legislation, case law as well as government feasibility

[29] SPS Article 12.2-12.4
[30] SPS Article 12.7
[31] Scott Book, 47, 66
[32] R.A Posner, 'A Theory of Negligence' 1 J of Legal Studies 28 (1972)
[33] 159 F.2d 169 (2d Cir. 1947)

studies, especially in relation to environmental hazards.[34] Fisher writes that there is a widespread trend among governments of many advanced states to improve accountability in the administrative governance of risk control through verifiable, objective procedures and this requires analytic, formal methodology for managing facts regarding risk, such as some form of cost-benefit analysis.[35] Sunstein has argued that cost-benefit analysis may be misleading because it creates an illusion of certainty whereas many attempts to quantify costs of injuries and benefits from prevention are deeply flawed. Still, he urges that it is a useful source of information and can provide helpful guidance for agency decisions especially in light of the often irrational approach humans take towards evaluating risk[36]. In contrast, Foster contends that risk assessment consists both of an objective and subjective element that undermines the functionality of formal cost-benefit analysis including in favour of individual sensitivities, such as, for example, the significance of death.[37] Trebilcock and Soloway too have cautioned that cost-benefit type analysis should not attempt to make social and political judgments about what risks society should be prepared to assume.[38] Generally cost-benefit analysis can be seen as a useful mechanism for assessing the social welfare engendered by a particular policy option especially if some room is accorded in the process for public participation.[39]

---

[34] See Cass Sunstein, *Risk and Reason: Safety, Law and the Environment* (Cambridge University Press, 2002) noting for example cost benefit analysis in the Safe Drinking Water Act 42 U.S.C. par 300 and in Chemical Manufacturers Association v Environmental Protection Agency 217 F 3d 861 (DC Cir 2000).

[35] Elizabeth Fisher "Drowning by Numbers: Standard Setting in Risk Regulation and the Pursuit of Accountable Public Administration" 20 Oxford Journal of Legal Studies 109 (2000) at 127-128.

[36] Sunstein, *Risk and Reason* at 35, 49, 105, 154.

[37] Foster article JIEL at 439-440, referring to the International Law Commissions' view of risk assessment which contains both objective and subjective elements: Article 2(a) Articles on Prevention of Harm from Transboundary Activities, 2001. Report of the International Law Commission on the work of its Fifty-third session, Official Records of the General Assembly, Fifty-sixth session, Supplement No 10 (A/56/10), Chapter V, available at <http://www.un.org/law/ilc/texts/prevention/preventionfra.htm>.

[38] Trebilcock and Solway at 549

[39] Fisher, "Drowning in Numbers" at 127

Cost benefit type analysis as a tool of risk management is not new to the sphere of international trade and indeed as noted above it is reflected in Article 5.3 of the SPS Agreement, which requires that costs of precaution should be considered when assessing the legitimacy of a health protection measure. It is noteworthy that the EC argued in its submission to the WTO Committee on Trade and the Environment that precautionary measures must be based upon a cost-benefit analysis of action and inaction[40]. Trachtman has theorized that the WTO's rules of negative integration, such as proportionality and least restrictive means under the SPS Agreement, can also be understood as techniques of maximization under cost-benefit analysis. He writes that with some room for judicial discretion within the DSB, regulatory measures will accordingly be prohibited if they fail to pass a test of efficiency.[41] Perhaps the most comprehensive application of cost-benefit type analysis to the WTO is that of Trebilcock and Soloway who argue that Members must be able to justify regulations that impact upon trade by demonstrating that they are based on plausible (not patently unreasonable) risk management, which will require some form of mandatory cost-benefit analysis.[42]

A more systemic, objective approach to the evaluation of domestic measures, such as those involving health, is required because the existing standard of review is currently dissapointingly opaque. As outlined in Article 11 of WTO's Dispute Settlement Understanding, the standard of review of domestic regulatory measures by a panel is neither total deference to the regulatory authority nor a *de novo* review but rather an "objective assessment of the facts". In the context of health measures,

[40] WTO Committee on Trade & Environment, Communication from the European Communities on the Precautionary Principle WT/CTE/W/147 27 June 2001 at 14.
[41] Trachtman "Regulatory Jurisdiction and the WTO" 10 JIEL 631 at 647-648
[42] M Trebilcock and J Soloway, "International Trade Policy and Domestic Food Safety Regulation: The Case For Substantial Deference by the WTO Dispute Settlement Body under the SPS Agreement" in DLM Kennedy and JD Southwick eds. *The Political Economy of International Trade Law* (CUP, Camb, UK, 2002) at 551. .

Button has criticized this standard as incoherent and unhelpful and has accordingly recommended a clearer "reasonable regulator" standard - would a reasonable government body have come to the same conclusion with respect to risk assessment.[43] Epps urges that the domestic risk assessment should be reasonable in the circumstances, which means neither arbitrary nor manifestly absurd.[44] But not even these suggestions nor Trebilcock and Soloway's reference to a "not patently unreasonable standard" are sufficiently clear as to offer genuine guidance for WTO panellists. As we shall now see, the J-Value equation, which incorporates logical, flexible numeric values for variables risk, cost and gain offers an objective, practical standard for the review of health related measures while retaining sufficient deference to Member's regulatory autonomy.

ii) The J-Value and Reasonable Spend

Concerns regarding disproportionate spending on risk prevention by governmental authorities in the United Kingdom prompted professors Philip Thomas and David Stupples to develop a mathematical model that evaluates the extent to which monetary expenditure on risk prevention is reasonable or efficient from a cost-benefit perspective and as such can be viewed as a sensible regulation from a perspective of good governance. The resulting Judgment or J-Value equation has been applied to safety precautions in the United Kingdom for road and rail transportation, the nuclear industry as well as offshore oil and gas. It has notably revealed that various safety expenditures considered and implemented by the UK Department of Transport relating to rail accidents were wasteful by several orders of magnitude whereas some

[43] Catherine Button, *The Power to Protect: Trade, Health & Understanding in the WTO* (Hart, Oxford, 2004) at 218-220.
[44] Tracey Epps, "Reconciling Public Opinion and WTO Rules Under the SPS Agreement" 7(2) World Trade Review 359 (2008) at 379.

treatments implemented by the National Institute for Clinical Excellence to control diseases were very cost-effective.[45]

The J-Value relates exclusively to risks to human health and life, not to animals or plants and therefore it does not encompass the entire sphere of risks encapsulated in either GATT Article XX b) or the SPS. The J-Value formula therefore could not have been implemented, for example, to ascertain the reasonableness of measures taken in the *US-Shrimp* dispute which concerned the health effects on animals. In simple terms, the J-Value formula balances the monetary cost of a proposed safety measure against the maximum amount that the risk affected group should be prepared to spend, according to how much their lives should be worth to them in economic terms according to length of life and quality of life, which is related to available income and leisure time. Thus the equation considers how much a person's life is worth to them, not from the perspective of national benefit. This variable operates as a direct acknowledgement of the component of risk assessment that is tied to the socio-economic conditions in various societies, given that averages within a society can ever be considered truly representative of individuals within that society. Any numeric result from the equation which is below 1.0 (indicating equality between actual and reasonable spend) is an efficient precaution. However a very low value should not be taken to indicate that more should be spent, but rather excellent value for money has been achieved. Those greater than 1.0 demonstrate excessive, and therefore unreasonable spending, from which we might infer in a WTO context a motive of trade protectionism or else poor administrative governance, the latter of which may well beyond the purview of the WTO. J = 1.0 will denote the maximally risk-averse

[45] P.J. Thomas, D.W. Stupples and M.A. Alghaffar, "The Extent of Regulatory Consensus On Health and Safety Expenditure Part 2: Applying the J-Value Technique to Case Studies Across Industries" 84 (B5) Process Safety and Environmental Protection 337 (2006)

situation where the maximum reasonable sum is being spent on safety measures. A simplified explanation of the how equation is formulated follows.[46]

The first and perhaps most controversial stage in deriving the J-Value is to establish an appropriate measure for the quality of life. Thomas and Stupples theorize[47], that this can be quantified based on two factors: 1) how long an individual can expect to live from the present onwards and 2) how much money an individual will have available to spend, both on necessities and luxuries. While at first blush this calculus may appear callous, the logic that one can enjoy their life more if they have more free time and more money to spend during that time is compelling. However this theory recalls Foster's suggestion that risk assessment necessitates a subjective evaluation of the way in which an affected person feels about death, which should in turn be related to how they feel about their lives. Presumably death will be more ominous to someone the happier their life is - although this may also be dependent upon the extent of one's religious convictions or views of the afterlife more so than quantifiable elements such as income and life expectancy. Moreover, some individuals may prefer work to leisure and wealth could be viewed as a burden. These unresolved issues are beyond the scope of this article and may defy quantification in any meaningful way.[48] Keeping to the quantity (length of life) and quality (income) criteria, a suitable measure for quality of life is therefore given by Q_0 where:

---

[46] For a more comprehensive explanation see P.J. Thomas, D.W. Stupples and M.A. Alghaffar, "The Extent of Regulatory Consensus on Health and Safety Expenditure Part 1: Development of the J-Value Technique and Evaluation of Regulators Recommendations" 84(B5) Process, Safety and Environmental Protection 329 (2006)

[47] See also M.D. Pandey and J.S. Nathwani, "A Conceptual Approach to the Estimation of Social Willingness To Pay for Nuclear Safety Programs" 224 Nuclear Engineering and Design 65-77.

[48] For an interesting discussion of observed trends in the relationship between wealth, health and the quality of life see Avner Offer, *The Challenge of Affluence: Self-Control and Wellbeing in the USA and Britain Since 1950* (OUP, Oxford, 2006)

$$Q_0 = G^q X$$

Here X is the life expectancy of the average individual in years and G is the average annual earnings. Superscript q is the "work-life balance" meaning the ratio of the average person's time spent working to the time remaining (total life remaining minus working time). In the United Kingdom, this ratio is taken to be roughly 1:7 (one's remaining time alive is approximately seven times longer than the remaining amount of time one will spend working). Of course this ratio should be different for developing nations where the work force is younger, life expectancy shorter and there is less time available for leisure, perhaps 1:4 or even 1:3, although in some LDCs there may be even more leisure time. We see here that the flexibility of the J-Value in its accomodation of labour trends among different nations makes it a suitable process for deriving an international standard, although the precise level of protection chosen in each state may vary from state to state. Similarly, average annual earnings which may be taken as the GDP per capita, and life expectancy and which can be taken from actuarial tables will vary from state to state.

The next aspect of the formula is to include a discount rate for life expectancy, which accounts for the reality that goods and services that an individual can use today are more valuable than those you must wait to have before you can enjoy them. The specific discount rate used in cost-benefit analysis remains a very controversial issue, primarily because discount rates are inherently subjective.[49]Because of the sizable effect that a discount rate can have on the results of a cost-benefit analysis, many economists advocate the implementation of several discount rates and that the chosen

[49] but see D Pearce and D Ulph "A Social Discount Rate for the United Kingdom" (1995) GSERGE Working Paper GEC 95-01 <http://www.uea.ac.uk/env/cserge/pub/wp/gec/gec_1995_01.pdf> (last accessed October 2008)

rate should be based on the time horizon of the policy in question - the longer the period over which costs and benefits accrue the lower the discount rate should be.[50] Thomas and Stupples argue that low discount rates are appropriate in the case of many health precautions because of the long period over which health effects such as cancer appear. They suggest that a rate of 1-4% per annum should be used, although this may depend on the specific nature of the health risk addressed through the measure[51]. The final version of the life-quality index, Q, is therefore given in terms of the discounted life expectancy, X_d in years:

$$Q = G^q X_d$$

The change in life expectancy that is anticipated to result from a precaution that will enhance the safety of a group or a nation can be deduced to determine a maximum annual expenditure that government should be prepared to undertake. This works under the following logic: when a precautionary measure is taken, life expectancy should increase because of lower exposure to risk, but the yearly income available to the average person will decrease - the individual is giving up a portion of his income in order to pay for the expected extension of his life. While the expense may actually born by the state (or another state as we shall see below) the benefits should still be based on the willingness to pay of the benefiting group. This is consistent with the general principle of welfare economics that the benefits of a public program are measured most appropriately by the aggregate willingness to pay on the part of those benefiting from the program. We can conclude that it is efficient or

[50] E.g. C.M. Harvey, "The Reasonableness of Non-Constant Discounting" 53 Journal of Public Economics 31 (1994). For further discussion of the role of discount rates in regulatory action see Cento Veljanovski, *Economic Principles of Law*, (Cambridge U Press, 2007) 29-32.
[51] Thomas, Stupples and Alghaffar,"The Extent of Regulatory Consensus" at 331. Discount rates of 0% and 2.5% are used for each set of data in their study.

reasonable to engage in a certain safety measure only if the new resulting life quality index is sufficiently higher than it was before the precaution was undertaken taking into account the decrease in quality of life associated with loss of income. The change in life expectancy resulting from the enhanced safety precaution may be derived from physicians' estimates or from calculations using actuarial tables. As noted above the J-Value does not supply nor does it evaluate the credibility of the scientific data upon which probable life expectancy improvements are derived and as such it does not address the problem of scientific consensus mandated by the SPS Agreement.

The J-value is ultimately determined by dividing the actual or anticipated annual expenditure on precaution associated with the regulatory measure in money per year (a') multiplied by the total population of affected individuals (pop) and therefore denoted as a'_{pop}, by the maximum amount that the government *should* be prepared to spend (or as we shall see below, should be prepared to require a trading partner to spend) based on the increase in quality of life that it should engender in the affected group (denoted as a_{pop}).[52] This is represented in the following simplified equation:

$$J = a'_{pop} / a_{pop}$$

Again, an acceptable safety scheme is one that is less than unity: a safety benefit results without a disproportionate use of financial resources. The complete J-Value

[52] The equation can be modified to account for a single initial spend rather than an annual one. See P.J. Thomas, D.W. Stupples and M.A. Alghaffar, "The Extent of Regulatory Consensus on Health and Safety Expenditure Part 1: Development of the J-Value Technique and Evaluation of Regulators Recommendations" 84(B5) Process, Safety and Environmental Protection 329 (2006) at 331.

equation can be re-written by breaking down these variables into their constituent parts:

$$J = q\, X_d\, a' \,/\, (NG\, \Delta X_d)$$

where q is the work life balance ratio a′ is the annual expenditure per person per year in the exposed group, and N is the number of people in the population exposed to and then saved from some threat. Note that this is not the entire population of the Member state which imposes the measure and must be modified depending on the traded commodity in question. For example, if the product is one that would only ever be used by a woman of childbearing age, such as a contraceptive device, then the population of males and females not of childbearing age must be excluded. G is the average annual earnings of those individuals who are in the exposed group of size, N, which can be taken to be per capita GDP[53]. ΔX_d is the discounted change in life expectancy averaged over the group brought about by the safety scheme in question.

In summary, since the J-Value represents the ratio of the actual amount spent (or planned to be spent) to the maximum reasonable amount that should be spent given the expected (scientifically demonstrated) gains in life extension, we can conclude that a J-Value greater than 1.0 will cause a net disbenefit to society: more will have been spent than should have been. If a J-Value of 2.0 results, then two-times as much money is spent and the associated health-oriented prohibition could therefore be viewed as unreasonable. Before this process can properly be applied to

[53] The nation's GDP will not necessarily be the most appropriate means of establishing this value, particularly in the case of Lesser Developed Nations where women's *per capita* income will be substantially below the average for the nation. Life expectancy for this sub-group should be adjusted accordingly.

interpretation of GATT XX b) and the SPS by the WTO panels the J-Value must be directly linked to trade effects.

V The J-Value and International Trade

i) Establishing the Figure for Annual Spend on Risk Prevention

The obvious difficulty with adapting this formula to the sphere of international trade is the need to equate monetary expenditure in risk prevention (the *a´* figure), which the formula was designed to evaluate, with the enacting of health protection legislation, which does not strictly speaking involve an outlay of money, other than the nominal administrative costs associated with the legislative process. We must therefore ascertain a means of translating regulatory measures, such as a ban on a certain type of hormone in all imports of beef, into a quantifiable monetary value.

The most sensible way that this total safety expenditure could be calculated is to add up the total costs that would be incurred by the complainant nation in conforming to the health measure as required by the respondent state. This approach is intuitively appealing because is consistent with the polluter-pays principle - those who create the risk of harm should bear the costs of protecting against it. This also reflects the reality that that governments act to increase national welfare for the benefit of their citizens, even at the expense of other nations in the form of externalities.[54] For example, where more stringent product testing is required on a certain good before it enters the importing nation, the question would therefore be: how much does it cost foreign producers to perform the mandatory testing? These costs are properly termed externalities - they represent a cost associated with a particular regulatory action that is not born by the state enacting it but rather by some

[54] Green and Epps "The WTO, Science" at 289

other third party. As noted above Members are expressly required to consider these costs under the SPS Article 5.3. It is noteworthy that the Appellate Body observed in *US Gasoline* that the US did not adequately account for the cost to foreign exporters (gasoline refiners) from the measure, which was indicative of unjustifiable discrimination as prohibited by the chapeau of Article XX of GATT[55]. We should expect that the cost of conformity with a health related measure as born by the exporting state might be notional rather than actual in the case of LDCs because of the impossibility of such state complying with the requirement due to lack of technical knowledge. Note that a different figure for cost of precaution could result for each complainant country as the cost of conforming to a particular health regulation may be higher in absolute terms in one country than in another. Relative costs, such as the relationship between the cost of conformity to the measure to the nation's own GDP will be irrelevant as this could result in greater tolerance towards health risks from poorer countries. This principle is explicitly included in some governments' domestic guidelines with respect to health and safety precautions.[56]

In situations of an outright ban on a particular product because of health risk, such as in the *EC-Asbestos* dispute, the costs of conforming to the measure would be an inappropriate means of calculation because there would be no direct costs. In such situations we might be tempted to use the volume of trade lost or other trade-related effects as a means of quantify the cost of precaution variable as a substitute for the direct costs of adhering to the regulation. It should be noted that regulatory barriers typically cause significantly greater inefficiencies than other forms of protection such

[55] A similar conclusion was reached by the Appellate Body in United States - Import Prohibition of Certain Shrimp and Shrimp Products WT/DS58/AB/R.

[56] For example the United Kingdom's Health and Safety Executive guidelines which establish that "The ability of the duty holder to afford a control measure is not a legitimate factor in the assessment of costs. This ensures that duty holders are presented with a level playing field". "Reducing Risks, Protecting People: HSE's Decision Making Process" (2001) United Kingdom Health and Safety Executive at 67 < http://www.hse.gov.uk/risk/theory/r2p2.pdf> (last accessed October 2008)

as tariffs (which produce government revenue), quotas (quota rents are enjoyed by domestic importers or foreign producers who can raise prices) and subsidies (which increase consumer surplus in the relevant market).[57] Still, even regulatory impediments should result in some advantage to domestic producers who are able to conform to the regulatory requirement at less expense than their foreign competitors. Any higher production costs associated with so doing could then be passed on to those consumers who are willing to pay higher prices. Using a trade-effects approach to quantify cost of precaution is therefore problematic because according to Trachtman any losses suffered by foreign exporters who cannot adhere to stricter regulation and consequently must terminate trade of that good are typically fully accounted for in the advantages accorded to domestic producers, or on a worldwide scale, in the overall enhancement of trade in the affected product between other states.[58] A figure could also be imputed for producers' lost profits which have resulted from any decrease in sales because of these higher prices. Moreover, there might additionally be unsatisfied demand among consumers in the importing state due to the impossibility of substitution of a prohibited good or an insufficient quantity of the good following the termination of export because of the mandated but prohibitively expensive precaution. These inefficiencies associated with higher costs, unsatisfied consumer demand and decreased producer profits should be expected when an expenditure exceeding J-Value 1.0 is sanctioned as this will mean that safety has not been properly valued because those who benefit from the protection would themselves not value the resulting increase in life expectancy at this level. Excessive spending on the

[57] Trebilcock and Soloway at 542.
[58] Joel Trachtman, "Regulatory Jurisdiction and the WTO" 10 JIEL 631 (2007), who notes that non-pecuniary externalities, such as human rights and environmental damage are not fully accounted for, at 644.

regulation of environmental risks is linked to deleterious effects on society such as increased prices, lower wages, unemployment and poverty.[59]

It should be noted that public choice theory suggests that regulatory health decisions could also have unquantifiable benefits for self-interested politicians as well as financial ones to the domestic producers which may not be in line with public interest.[60] The J-Value does not attempt to embody such individualistic gains in its assessment of regulatory reasonableness. Indeed, its lack of recognition of them demonstrates that it is concerned with measurable advantages to society as a whole.

ii) The J-Value in Practice: A Hypothetical Example

A hypothetical example of a health-related measure should illustrate how the J-Value would work in practice at the WTO. Let us imagine that the government of Canada passes a regulation requiring that all peachnuts (which are an imaginary fruit consumed in Canada, 80% of which are imported) must be sprayed with a new chemical Bug-X before they enter the country in order to prevent the infestation on peachnuts of Dragon Worms. These microscopic organisms can cause severe intestinal infestations in consumers of peachnut products, which can lead to problems such as bowel cancer. We will take the work - life balance ratio in Canada to be 1:7 or 0.14 (similar to that of the United Kingdom). Assuming that the peachnut-eating population has the same age distribution as the Canadian population as a whole then undiscounted life expectancy of the average peachnut eater will be 35 further years of life.[61] For the sake of instructive simplicity here we will use a discount rate of 0%. In

[59] Sunstein *Risk and Reason* at 78.
[60] See Warren Schwartz and Alan Sykes "The Economic Structure of Renegotiation and Dispute Resolution in the World Trade Organization" 31 J of Legal Studies S179 (2002) for discussion of the application of public choice theory to the WTO.
[61] Average life expectancy of 74 years and average age of 39 years: Statistics Canada http://www.statcan.ca/Daily/English/080114/d080114b.htm (last accessed 14 August 2008)

this hypothetical example there are 100 thousand Canadians who consume peachnuts in sufficient quantities to be exposed to a significant risk of Dragon Worms, according to a reasonably plausible Canadian university study. Recall that the J-Value does not inquire into the veracity of the scientific evidence and WTO panels will generally take a deferential approach towards the scientific evidence tendered by Members. The average annual earnings of these people (which we will take to be average earnings for all Canadians) is the *per capita* GDP of Canada which is approximately 48,000 Canadian dollars per year in 2008.[62] Research conducted by the same university has determined that using Bug-X spray on peachnuts will increase the life expectancy in the affected group by approximately 0.02 years per person (just over one week of extra life per person). The annual cost of spraying imported peachnuts with Bug-X by the complainants in this matter, the Philippines, is the equivalent of CDN $5 million per year, resulting in an annual spend per affected person of 50 Canadian dollars. This means that in order to conform to the measure the Philippines government (or the private peachnut exporting firms in the Philippines) would have to be willing to spend 50 Canadian dollars per Canadian consumer per year to eliminate the danger associated with Dragon Worms on peachnuts. Put another way the Canadian government could be said to expect that the Philippines should be willing to incur this cost per affected Canadian per year should it wish to continue exporting peachnuts to Canada. Displeased with this burden, the Philippines has requested the establishment of a panel regarding the illegitimacy of Canada's Dragon Worm safety measure under the SPS, arguing that it is a violation of national treatment (a disguised attempt to favour the consumption of domestic fruits which do not carry Dragon Worms) and that it is not saved by GATT XX b).

[62] May 2008 figure: Statistics Canada <www.statscan.ca/Daily/English> (last accessed 14 August 2008)

With values established for all of the variables we can now implement the J-Value for a reasonable annual spend on this precautionary measure:

$$J = \frac{q}{G} \quad \frac{X_d}{\Delta X_d} \quad a'$$

$$J = \frac{0.14}{48{,}000} \quad \frac{35}{0.02} \quad 50$$

$$J = (0.000002917)\ (1750)\ (50)$$

$$J = 0.25 \leq 1.0$$

Since the J-Value is less than 1.0 we can conclude that this regulatory measure enacted by the Canadian government is reasonable because it yields greater economically quantifiable gains than it costs. In fact, the Bug X spraying scheme could be augmented and made much more expensive without creating a net disbenefit. The equation also tells us that, under the principles of welfare economics, each Canadian peachnut eater would be willing to pay $200 per year to extend their lives by one week, which seems intuitively plausible.[63] Consequently it should be upheld by the WTO panel under both the SPS and GATT.

VI The J-Value and WTO Dispute Settlement

With regards to dispute settlement itself, GATT jurisprudence has shown that the burden of proof in the implementation of an Article XX exception (both in relation to

[63] Note that the J-value would be higher by a factor of about two if discount and loan rates of around 2.5% were used. The basic conclusion in this case would be unaltered, however.

the subsection and the chapeau) is on the party invoking it.[64] The Appellate Body has shown that the first stage in invoking an exception is to ascertain whether the measure falls within one of the listed exceptions, such as b), then the next stage is to determine whether the justification satisfies the chapeau.[65] Essentially, then, it is up to the Member state enacting the precautionary measure to show why it does so, or put another way that the burden of the precaution justified the expected benefit. Unlike some of the other listed exceptions under Article XX, subsection b) requires that the measure be "necessary", which suggests a higher standard than merely "related to" which applies to some of the other subsections. The equally problematic issue of necessity as addressed by a number of Appellate Body rulings[66], concerns the relationship between the measure and the desired goal. The Appellate Body has clarified than the consideration of necessity begins with an assessment of the relative importance of the goals furthered by the challenged measure and this may be facilitated by the J-Value equation as it is based upon the expected gains in terms of quality of life, as a function of length and wealth. If increases in quality of life (as determined by the Member's own largely unquestioned research and testing) are insufficient given their associated costs, then this suggests that a measure is arbitrary and unjustified and therefore transgresses the chapeau. Panels could infer that a measure yielding a J-Value greater than 1.0, as it is economically wasteful, has been pursued for a reason other than health protection and therefore may be violation of national treatment or most favoured nation obligations.

The adjectives "necessary" employed in Article XX b) may be judicially instructive for the precise interpretation of the J-Value as calculated: as a fairly strict standard, "necessary" might indicate some value even lower than 1.0 - meaning that

[64] EC - Tariff Preferences [95]; US - Shrimp [157].
[65] US Shrimp IBID [120].
[66] e.g. Korea Beef AB [164]

the health benefit must be greater than parity with cost in order for it to justify a trade distortion. "Necessary" as indicated under Article XX d) was taken by the Appellate Body to refer to a "range of degrees of necessity"[67] so it may be assumed that this also applies to Article XX b)[68]. Most agree that the necessity test has been applied more strictly under XX b) than under SPS (or the TBT Agreement).[69] As such a lower J-Value might be required to satisfy the XX b) exception than it would to qualify as a legitimate SPS measure.

One problematic feature of the J-Value is the requirement that country-specific data for the values of life expectancy and annual income (GDP) are used while certain health hazards may have international effects, such as the danger to a migratory species of sea turtle in the *US-Shrimp* dispute which dealt with GATT XX. In these circumstances it would be necessary to average out the GDP and life expectancy across all peoples from all affected states - which could lead to a distorted picture of cost-efficiency for nations whose values for these variables fall on the extreme ends. Fortunately we should expect that there will be relatively few risks to human health that pose international threats such as the risk to oceanic turtles.

With respect to disputes brought under the SPS Agreement members are free to determine the level of health protection they desire for certain risks. However, once chosen the measure enacted must bear a rational relationship to this goal as demonstrated by scientific principles. That conformity with international standards may suffice in this regard is problematic because, as noted above, there is no indication that such standards are themselves objectively or rationally based. More specifically, such standards may represent excessive expenditures of financial

[67] Korea - Various Measures on Beef;
[68] Van den Bossche at 606
[69] Nick Covelli and Victor Hoholtz, "The Health Regulation of Biotech Foods Under the WTO Agreements" 6 JIEL 773 (2003) at 793

resources and as such be unjustifiable. In order for the measure to be viewed as legitimate from a trade perspective under the J-Value, the economic benefits (in terms of increased life expectancy in which income can be enjoyed) must exceed the costs of the implementing the precaution, both at the domestic level as well as born by the complainant exporting state which must bring its products into conformity with the measure at some expense. The logic of the J-Value therefore is that even if there is a genuine risk, and even if it is one encapsulated in an international standard, the nation imposing the regulation cannot do so if the cost to its trading partner is too high relative to the gain, otherwise it will be an undue barrier to trade. Consequently the J-Value is insensitive to irrational or politically motivated risks which do not result in tangible economic gains through increased quality of life.

There may, however, be some room for recognition of Member state's idiosyncratic approach to various risks within the J-Value. The decisions in *EC Hormones* and *Australia Salmon* illustrate the importance of consistency among measures implemented by the same WTO Member. In order for the challenged measure to be viewed as non-arbitrary or non-discriminatory similar levels of precaution should be maintained for similar risks. The J-Value is instructive here because it establishes a means by which various health protection measures by one Member state can be measured against each other in terms of their value for money, even if they are irrationally based in an absolute sense. Thus if a J-Value of 2.0 for one precautionary measure results, although it is therefore an excessive expenditure from a strict economic standpoint, a panel might conclude that it is legitimate if other precautions implemented by this Member state also have J-Values at this high level, which would suggest that although this nation may have an irrational willingness to spend on safety, because this approach is consistently applied it precludes a finding of

discriminatory intent behind a certain measure. Of course this ignores the reality that certain groups may be (illogically) less willing to bear smaller risks for certain types of dangers than for others based on various emotive factors yielding unjustifiably different J-Values.[70] A deferential standard of review of national levels of protection could be accorded generally by the Dispute Settlement Body by permitting, say, J-Values of up to 1.5 even though they represent inefficient administrative decision-making. Such malleable interpretations of the J-Value could be bolstered in these circumstances through the submission of evidence regarding public sentiment regarding the risk in question. It would be impossible to incorporate such data, involving for example, subjective impressions about dangers of certain chemicals used in food, into the equation itself. Unfortunately broad discretion of this nature undermines the enlightening certainty of the equation as well as the potential for the J-Value of 1.0 as an international standard to which all Members should adhere.

Fisher notes that the SPS Agreement is directly concerned with the reasonableness of administrative action as reflected in the extent to which an accepted risk is commensurate with enacted legislation. She terms this administrative constitutionalism, or how public administration should be conducted and held to account. Health regulation, she writes, should not be subject to a strict democratic standard, involving for example, extensive public participation, because it is conducted at the administrative level by delegated officials who may possess expertise in certain fields.[71] Howse agrees, asserting that the SPS does not usurp legitimate democratic choices for stricter regulations but rather improves the quality

[70] Cass R Sunstein and Richard Pildes, "Experts, Economists and Democrats" in C Sunstein ed. *Free Markets and Social Justice* (OUP, Oxford, 1997) at 133.
[71] Fisher "Administrative Constitutionalism" in book at 338

of rational deliberation about risk management.[72] Esty has similarly argued that the WTO must endeavour to engage in good governance through carefully crafted administrative rules and procedures for decision-making based upon, *inter alia*, rationality, efficiency and clarity.[73] Button too recommends a "reasonable regulator" standard of review of domestic measures because this method concentrates the panel's mind on the fact that it is reviewing a regulatory action and not a disembodied set of facts.[74] Finally Scott holds that reference to the appropriateness of standards in the SPS is indicative of the Appellate Body's important role in the scrutiny of the standardization *process* - the route by which such organizations arrive upon the standards they promulgate.[75] The J-Value is well suited to questions of this nature as it does not evaluate the credibility of the scientific evidence which informs the extension of life expectancy, but rather gauges the administrative logic underpinning the expenditure involved in addressing the danger as revealed by reference to economic cost. Consequently we can conclude that a decision to invoke a certain standard of health protection will be WTO compliant if there was sufficient scientific investigation (process) which will be determined by reference to the relative costs and benefits of acting on the scientific evidence that the Member has obtained.[76] The J-Value is indicative of such legitimate process. We might further expect that panel and Appellate Body review of such essentially procedural requirements will be less prone to error than a review of the substantive content of a regulation with respect to its effect on health (the extent to which a given precaution results in an observed

[72] R Howse, "Democracy, Science and Free Trade: Risk Regulation on Trial at the World Trade Organization" 98 Michigan L R 2329 (2000) at 2330.
[73] Daniel C Esty, "Good Governance at the World Trade Organization: Building a Foundation of Administrative Law" 10 JIEL 509 (2007)
[74] Button at 221.
[75] Scott EJIL article at 331
[76] Howse at 2349

benefit), given the acknowledged fallibility of science.[77] Furthermore, tighter procedural requirements embodied by the J-Value may reduce the incidence of protectionist measures being implemented for the selfish political motivations of politicians seeking to advance the interests of rent-seeking by certain domestic industries and which are not reflected in the J-Value calculus.[78]

As a prelude to the formal implementation of the J-Value during the dispute stage, the formula should be considered by the SPS Committee under its mandate to encourage the use of international standards by Members. A standard could be conformity with an established process of regulatory assessment as well as a result, such as an acceptable level of a specific contaminant. This should ensure that international standards, such as those set by the international standard setting bodies, are economically sensible. Implementation of the J-Value would therefore be encouraged among all Member states as a prelude to regulatory action before the stage of dispute settlement. This role for the J-Value would be less controversial than a mandatory test to be implemented by the DSB in relation to health measures or, even less likely, as a modification of the text of the SPS or GATT XX b).

VII Conclusion

The J-Value represents a simple, useful standard for interpreting the reasonableness of a health precaution measure according to the resulting benefit, as approximated by increases in the duration and quality of life of those who are protected and as such it gauges the social welfare engendered by a particular measure. More specifically, it can be adapted to the WTO arena to assist panellists in the determination of whether a health precaution is arbitrary or unjustified as outlined variously in the General

[77] Green and Epps at 307
[78] Green and Epps "WTO, Science" at 303

Exception for health and safety measures under GATT Article XX b) and the SPS Agreement. The chief limitations of the J-Value are firstly that it is only suitable for an evaluation of measures which are aimed at protecting human health and as such cannot assist with some of the larger policy goals for the protection of animal and plant life encompassed by these legal instruments because it does not acknowledge these gains in terms of quality and duration of life. Secondly, the J-Value does not clarify the what degree of scientific evidence can be viewed as sufficient for regulatory action, which is still an unresolved feature of Article XX b) and SPS related disputes which accord an indeterminate degree of deference to scientific findings as presented, especially if they are based upon international standards, which may themselves be unfounded. The J-Value also suffers from the familiar argument that it is simply impossible to quantify the value of a human life or an extension thereto in pure economic terms without some institutionalized recognition of the subjective view of risk through formal public participation. Finally and perhaps most problematically, even if we can accept that quality of life can be monetized, the logic underlying the J-Value is that a regulatory measure which affects trade should not be undertaken unless it makes economic sense to do so. Economic efficiency is therefore taken as a signal of trade-barrier legitimacy and it is not clear that this is necessarily true. Public choice theory tells us that a government may gain politically from imposing a measure even if there is an economic cost to society because certain measures may accord a benefit to certain politically powerful interests and this will not appear in the J-Value equation. However such socially misaligned measures may be precisely the ones which the WTO dispute settlement system should be mindful of catching - although such an explicit objective might run afoul of concerns of state sovereignty.

Still it is evident that the objective clarity and state-specific adaptability of the J-Value should warrant its consideration by WTO panels *ex post* (as well as by Member state governments *ex ante*) as a means of justifying a health safety measure that will have a deleterious effect on trade. Furthermore, it may represent the most suitable form of an international standard for the purposes of conformity with SPS obligations and as such it could be a valuable tool in the hands of the SPS Committee. Further research into this innovative equation may reveal that it could also have an important role to play in other areas of law, notably in the judicial assessment of reasonable precautions and the standard of care in the private law of negligence, much as the Learned Hand formula originally envisioned.