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Application of a Mechanism of Proportional
Reward Towards Global Innovation

Esteban Donoso



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APPLICATION OF A MECHANISM OF
PROPORTIONAL REWARDS TOWARDS
GLOBAL INNOVATION

ESTEBAN DONOSO*

For a rule to have an optimally positive impact on society, it must be a valid regulation (a rule that comes to be enforceable); just (with an axiological goal); effective and efficient (that can extract a maximum amount of welfare, however understood, for the people it regulates). This article aims to advance the international regulation of patent protection by improving upon the axiological considerations of global regulation, while contributing to its effectiveness and efficiency. It does so by proposing the introduction of proportionality in the TRIPS Agreement, so that each country will contribute to technological development according to its economic capacity. A formula, which renders a politically feasible result, is used to further explain this theory. The chance of conceiving a healthy globalization based on formulas that encourage the cohesion of humanity should not be overlooked. That being reflected, an event of global generosity without precedent in the history of mankind would be witnessed. Hobbes's theory would be proven wrong, and cohesion of humanity would be globally envisioned. The Achilles heel of the idea presented in this paper is that it maybe utopian; it would not be surprising that once again it is proven that homo homini lupus.

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INTRODUCTION

The intent of this paper is to offer a mechanism for the application of a very simple and novel idea: the insertion of the principle of proportionality in the current international scheme of invention protection.¹ Those who have more should contribute more. This paper proposes a very simple formula to extrapolate this general principle of law (proportionality) to the international patent scheme as implemented by the Agreement on Trade-Related Aspects of Intellectual Property Rights (hereafter “TRIPS Agreement”).

In relation to the global protection of inventions, John Sulston, winner of the Nobel Prize in physiology, asserted: “harmonization is obviously desirable in the long term, provided that at the same time the world becomes more egalitarian.”² I agree. As discussed in my previous work, this hypothetical scheme could provide more space for harmonization.³ First, proportionality could make the system more equalitarian with one single change.⁴ Then, as a second step, it could induce the

¹ For further discussion of the principal of proportional protection of inventions *see* ESTEBAN DONOSO, A GLOBAL SOLUTION FOR THE PROTECTION OF INVENTIONS (2014);

Esteban Donoso, *Justicia, Vigencia y Eficacia del Régimen Internacional de Patentes de Invención* (Univ. Andina Simón Bolívar – Ecuador & Corporación Editora Nacional, Serie Magister No. 98, 2011), *available at*

<http://repositorio.uasb.edu.ec/bitstream/10644/3121/1/SM98-Donoso-Justicia.pdf>.

² John Sulston, International Patent Law Harmonization 3 (Mar. 1, 2006), Presented at the WIPO Open Forum on the Draft Substantive Patent Law Treaty, *available at* http://www.wipo.int/export/sites/www/meetings/en/2006/scp_of_ge_06/presentations/scp_of_ge_06_sulston1.pdf. For a statistical analysis of the implication of patents on follow-on research, *see generally* Bhaven Sampat & Heidi L. Williams, How Do Patents Affect Follow-On Innovation? Evidence from the Human Genome (Oct. 26, 2014) (Preliminary Draft), *available at* <http://economics.mit.edu/files/9778>.

³ *See* Donoso *supra* note 1.

⁴ Proportionality may be introduced without upending the entire system, but through modification of article 33 of the TRIPS Agreement. This proposal does not seek to overrule the current global agreement. The political issue should be recognized with pragmatism, as it is further developed.

proper application of the TRIPS Agreement's regulations in each country by punishing inadequate protection, and could even weigh disparities among countries' laws compensating those countries which reward fields that other countries exclude. This second step still needs further analysis. This paper only addresses the implementation of the first step of this new concept.

This paper first provides a general overview of the current patent system. It then addresses the proposal from a quantitative prospective, presenting a very simple mathematical mechanism for the implementation of a proportional reward system. It concludes with a practical proposal, while recognizing that there could be many methods to this end. The mechanism presented tackles the first of the proposal's objectives, which is to establish a global proportional reward system based on the economic status of the countries in question. As can be seen in the chart at the end of this paper, this proposal renders a realistic result, making it politically feasible. The next step will be to include in the equation incentives to effectuate protection.⁵ This paper seeks to establish a starting point for discussion, not to provide all the answers that such a scheme will need.

I

BACKGROUND OF THE CURRENT GLOBAL SCHEME

The subjectivity inherent to the protection of inventions is a consequence of its very nature. The object of protection and duration are subject to the discretion of human conceptions. Thus, conceptually at least, we all can dream of different patent schemes, or even the inexistence of one. Nonetheless, there is a 20-year-long international status quo that has proven difficult to change.⁶

Over time, intellectual property evolution has determined that the current patent protection system is global, definitively linked to commerce, decentralized,

⁵ Eventually, according to the TRIPS Agreement, countries will be able to activate the disputed settlement mechanisms in cases of deficient application of TRIPS' regulation. The decision at the Bali Ministerial Conference of 2013, however, extended once again the "moratorium" on non-violation disputes regarding intellectual property. *TRIPS: 'Non-Violation' Complaints-Background and the Current Situation*, WTO, http://www.wto.org/english/tratop_e/trips_e/nonviolation_background_e.htm (last updated Dec.3, 2009). Proportionality could finally unlock the door of the "moratorium." *See Conclusion, infra.*

⁶ According to the TRIPS Agreement, a review was to take place four years after the entry into force of the WTO Agreements. Although the TRIPS Agreement was signed 20 years ago, no revisions have yet occurred. *Overview: The Trips Agreement*, WTO http://www.wto.org/english/tratop_e/trips_e/intel2_e.htm (last visited Nov. 19, 2014).

and a one-size-fits-all system.⁷ Many would like to see this structure change, by eliminating or amending one or many of these characteristics.⁸ Many others would like to see one or more of these characteristics strengthened. The system of proportionality proposed in this paper is not intended to change the overall nature of the current system, but to improve it by addressing some of the issues raised by those concerned with the current systems characteristics. In that sense it has a marked status quo bias, which provides it with political pragmatism.⁹

Addressing the discussion of the international patent system with a status quo bias implies that intellectual property rights are here to stay.¹⁰ Thus, this paper does not tackle the “eternal” and unanswered causality question: does protection produce innovation, or, put it in a more general way, does the patent system “confer a net benefit or a net loss on society.”¹¹ There is no concluding empirical

⁷ “The TRIPS Agreement, which came into effect on January 1, 1995, is to date the most comprehensive multilateral agreement on intellectual property.” *Overview: The Trips Agreement*, *supra* note 6. Its worldwide, linked-to-commerce characteristics come as a consequence of the WTO. Its decentralized nature is commented in the next footnote and its one size-fits-all nature is commented in footnote 49.

⁸ As per the decentralized nature of the current global system, it goes without saying there are ways to give incentives other than by patents, which have advantages and disadvantages. “Whereas wealthy benefactors and governments can indulge in basic science and curiosity-driven research, a research agenda driven by patents is hostage to the market and to consumer sovereignty. The consumers who are sovereign are those with resources.” SUZANNE SCOTCHMER, *INNOVATION AND INCENTIVES 2* (2006). Many could dream of a global prize system. In the case of pharmaceutical research, for example, Joseph Stiglitz has proposed a “guarantee fund” (developing countries extending a purchase guarantee) and an “innovation fund” (a global prize rewarding research for widespread, costly diseases of particular concern to developing countries). JOSEPH E. STIGLITZ, *MAKING GLOBALIZATION WORK 124* (2006). Different countries could and would still use prizes and incentives other than patents to spur innovation. This is not precluded by the current system, and of course would still happen under a proportionality scheme, which is without any doubt commendable.

⁹ See William Samuelson & Richard Zeckhauser, *Status Quo Bias in Decision Making*, 1 J. Risk & Uncertainty 7, 45-46 (1988).

¹⁰ “To the extent that property rights become established in the status quo, any attempt to move away will be blocked. ... The status quo persists, and those who propose a change merely incur the wrath of others.” *Id.* at 46.

¹¹ SUBCOMM. ON PATENTS, TRADEMARKS, & COPYRIGHTS OF THE S. COMM. ON THE JUDICIARY, 85TH CONG., 2D SESS, *AN ECONOMIC REVIEW OF THE PATENT SYSTEM* (Comm. Print 1958) (prepared by Fritz Machlup), available at http://mises.org/sites/default/files/An%20Economic%20Review%20of%20the%20Patent%20System_Vol_3_3.pdf (hereinafter, *AN ECONOMIC REVIEW*).

evidence available to properly answer these questions.¹² The ideas herein proposed refrain from engaging in this unsolved debate.

This paper provides a solution for the status quo, which will be on its own quite an achievement. In practical political terms, to improve the status quo a global consensus should be accomplished. In order to achieve this seemingly impossible goal, the proportionality proposal gives attention to some of the concerns expressed by both sides of the controversy, by means of symmetry.¹³

¹² On October 24-25, 2014, NYU Law's Engelberg Center launched the Innovation Law & Policy Empirical Research Initiative. See Program, NYU Law Engelberg Ctr. on Innovation Law & Policy, Empirical IP Research Conference (Oct. 24-25, 2014), <http://static.squarespace.com/static/540a9275e4b0cca5ad25c4a2/t/5447ea7ae4b07be3ba763ebc/1413999226088/empiricalprintagenda.pdf>. The event started by quoting Fritz Machlup's AN ECONOMIC REVIEW, *supra* note 11, and then asking: "In 1958, economist Fritz Machlup famously concluded that 'none of the empirical evidence at our disposal' either confirms or confutes the belief that the patent system has promoted the progress of the technical arts and the productivity of the economy.' Can we say more than that today about the causal relationship between patenting and innovation? What can modern econometric and experimental approaches tell us about the effects that patenting has on the amount and direction of innovation?" *Id.* at 2. The consensus of the participants (academics, economist, lawyers, and statisticians from around the world) was that, as in 1958, there is no irrefutable empirical evidence to reach to a conclusion. To quote Machlup, "Scholars must not lack the courage to admit freely that there are many questions to which definite answers are not possible, or not yet possible. They need not be ashamed of coming forth with a frank declaration of ignorance. And they may make a contribution to knowledge if they state the reasons why they do not know the answers, and what kind of objective information they would have to have for an approach toward the answers." *Id.* at 79. This is exactly what the initiative comprises. The conference was the kick-off event of this ongoing initiative. The empirical initiative is commendable.

¹³ Two poles of opinion have been generated. The current scheme rests on the assumption that exclusive rights over an invention spurs innovation. As Richard Epstein puts it, "[s]ocial progress in our technological age is intimately bound up with the creation and protection of intellectual property," implying that technical progress is a product of the protection of intellectual property. RICHARD A. EPSTEIN, MFG. INST., INTELLECTUAL PROPERTY FOR THE TECHNOLOGICAL AGE 7 (2006). Many others think that intellectual property appears as a consequence of the interest of those who first created new technologies and who wanted to exclude others from using it. Thus, they think that intellectual property comes as a consequence of technological progress, and not that technological progress came as a consequence of intellectual property. Some call for the "abolition of all forms of private property in ideas." Eben Moglen, The dotCommunist Manifesto 6 (Jan. 2003), *available at* <http://old.law.columbia.edu/publications/dcm.pdf>. Many adhered to the patent paradox theory and think that the patent monopoly leads to the destruction of competition and ensures protection only for powerful companies. Many others think that without reward there is no chance of technical progress. There is no unequivocal answer. Proportionality could probably help answer

What if those who say that the current patent system is key for innovation are absolutely right? What if those who say that the patent system does not work at all are absolutely right?¹⁴ The answer for both questions, from an international commercial point of view, is that we should carry the burden of our mistakes or the cost of our mastery evenly, and thus proportionally to a countries' economic capacity. In this hypothetical system the interest in finding the right balance of protection will be higher, as the effects that a disproportionate protection potentially carries will be felt equally in all countries regardless of their state of economic development. This is the conceptual advantage of a proportional system.

The query does not stop here. It could be posed in regard to the amount or level of protection as well: are 20 years of exclusivity too much or not enough? What if the lack of enough protection is, for example, what has kept us from cold fusion?¹⁵ This is a threshold public good in the sense that, theoretically at least, with enough research and development it could be produced.¹⁶ To this end, the International Thermonuclear Experimental Reactor, a global project financed by international cooperation, seeks to generate unlimited virtually clean energy at a

this question in the future, in the sense that it could sincere the positions of the different countries (and those who, in the academic sphere, are influenced by nationalism).

¹⁴ These rhetorical questions are posed as if one of the two extreme positions is right. Probably the correct view sits in the middle.

¹⁵ The answers could probably come from, among many other angles, a contributor's game perspective. It appears that public goods with lower thresholds and higher rewards are more likely to be provided. Current models apply for threshold public goods, which, due to the lack of certainty of a patentable result, most individually considered potential innovations are not. For an example of a threshold case study, see Scott Barrett, *The Smallpox Eradication Game*, 130 PUB. CHOICE 179 (2006). Regarding public good provision, see generally, Charles Cadsby & Elizabeth Maynes, *Voluntary Provision of Threshold Public Goods with Continuous Contributions: Experimental Evidence*, 71 J. PUB. ECON. 53 (1999); Ramzi Suleiman & Amnon Rapoport, *Provision of Step-Level Public Goods with Continuous Contribution*, 5 J. BEHAVIORAL DECISION MAKING 133 (1992); Hans-Theo Normann & Holger A. Rau, *Simultaneous & Sequential Contributions to Step-Level Public Goods: One vs. Two Provision Levels*, J. CONFLICT RESOLUTION (forthcoming, published online before print May 6, 2014), available at <http://ssrn.com/abstract=1763442>.

¹⁶ In that sense, cold fusion is different that most research for innovation. *A priori* it is impossible to know if a specific research will render a patentable result. This is another fact that those in favor of the patent system invoke. "After the fact, patents are inconvenient because they restrict the use of valuable inventions. But before the fact they are necessary to create those same inventions. No one can assume that valuable inventions will pop up magically in the public domain if their inventors received no reward for their labor and capital. Most inventions are costly to design and fabricate." EPSTEIN, *supra* note 13, at 10.

marginal cost of zero.¹⁷ This, arguably, could be humanity's greatest achievement (this could be the case of many other technologies not even conceivable at this point in time). The present study does not examine this question, though. It takes the current contribution, the status quo of twenty years, as a starting point. It argues for proportionality among the contributors, not for the perfect amount of contribution. Such a goal could only be attempted, if ever, after this first step is accomplished.¹⁸

This proposal's possibility of success rests in a commercial approach. The current regulations were established and are managed within the World Trade Organization framework.¹⁹ Stiglitz, referring to the WTO, thinks that "[t]rade negotiators have little incentive to think about the environment, health matters, or even the overall progress of science."²⁰ Their mandate is to care for their own, for their national trade. It is evident why developing countries will like the proportionality proposal, which would grant shortened periods of protection in their circumscriptions. Why would countries that would have a longer period of protection under this proposal, typically inventive countries, agree with it? The answer is simple. There are potential gains from trade. As the late Garry Becker put it (with regard to pharmaceuticals): "The burden of paying for the development of the world's new drugs, however, falls overwhelmingly on Americans: Most other nations impose controls over drug prices or undermine patents through

¹⁷ "ITER was first proposed in 1985, during a tense summit in Geneva between Ronald Reagan and Mikhail Gorbachev, who agreed to collaborate 'in obtaining this source of energy, which is essentially inexhaustible, for the benefit for all mankind.' Since then, the coöperation has expanded to include the European Union, China, Japan, South Korea, and India.... No one knows ITER's true cost, which may be incalculable, but estimates have been rising steadily, and a conservative figure rests at twenty billion dollars—a sum that makes ITER the most expensive scientific instrument on Earth." Raffi Khatchadourian, *A Star in a Bottle*, NEW YORKER, Mar. 3, 2014, available at <http://www.newyorker.com/magazine/2014/03/03/a-star-in-a-bottle>.

¹⁸ This paper does not seek to establish the equilibrium or the optimal period of extension for a patent, just for an equitable reward. Proportionality could make it easier to obtain objective economic conclusions and consensus, if the patent monopoly is shouldered proportionally by the different countries or trade regions of the world.

¹⁹ There is a lot of criticism regarding the linkage of intellectual property and international trade regulations. "Discussions over global standards for intellectual property should be taken out of the WTO and put back into a reformed WIPO, a World Intellectual Property Organization in which the voices of academia as well as corporations, consumers as well as producers, the developing as well as the developed countries, are all heard." STIGLITZ, *supra* note 8, at 128.

²⁰ *Id.* at 131. "The environment is the problem of the environmental minister, access to lifesaving medicines is the problem of the health minister, and the overall pace of innovation is a problem of the education, research, and technology ministers. So while trade agreements affect all of these areas, those who worry about them are not at the table." *Id.*

allowing cheaper generic copies. As a result, the U.S. is by far the most important market for recouping investments in new drugs....”²¹

This situation was not the intention of the rules that set the status quo (the TRIPS Agreement), but rather is the reality. Developing countries have furiously proclaimed that the TRIPS Agreement was imposed on them, causing much harm and little good.²² Many important academics have legitimized this discontent, creating a “letter of marque” for individuals and even countries to disrespect the global regulations on intellectual property.²³ As a consequence, the coercion of the WTO in this issue has been undermined, since it is impossible (in light of the moratorium), and even politically inconvenient, for inventive countries to tackle every violation.

The political feasibility of the proposal rests under the assumption that, with proportionality, patent enforcement would improve in those countries in which it is deficient. Proper enforcement would not burst spontaneously from the application of proportionality, although a psychological effect towards this result could come from it.²⁴ Channels to achieve a proper application of the regulations by the different countries should be part of the compromise. Furthermore, as stated in the conclusion of this paper, a weighing mechanism that takes into account proper application of the rules, could be embedded in the formula presented.

²¹ Gary S. Becker, “*Get the FDA Out of the Way, and Drug Prices Will Drop*,” *BUSINESSWEEK*, Sep 16, 2002, at 16, available at <http://www.businessweek.com/stories/2002-09-15/get-the-fda-out-of-the-way-and-drug-prices-will-drop>.

²² For a historical recount of developing countries’ perspective view, see DONOSO, *A GLOBAL SOLUTION*, *supra* note 1, at 8-44.

²³ A certain general tone of condemnation to patent holders, especially against pharmaceutical companies, has been present in the international arena since the late 1990s. “Pharmaceutical companies filed a lawsuit against the government of South Africa to contest the government’s ability to use WTO access provisions—in this case, compulsory licensing—to make HIV/AIDS drugs available there. The case was dropped in April 2001.” STIGLITZ, *supra* note 8, at 316 n.40. From then on the trend has been the same. For instance, Stiglitz describes developing countries that do not act like Brazil, which used its bargaining power and compulsory licenses threats to get a deal from Abbott for an antiretroviral medicine, as “less astute.” *Id.* at 121. This letter of marque is even given to developed countries. “Myriad [Genetics] eventually developed a [cancer] screening technology, and asks \$3,000 for a complete screen; it refuses to let other firms perform the screen. The province of Ontario is ignoring this, allowing its citizens to be screened for free.” *Id.* at 314 n.26.

²⁴ See DONOSO, *A GLOBAL SOLUTION*, *supra* note 1, at 117-119.

II

THE MECHANISM AND ITS RESULTS

A. *Basic Economic Considerations*

From the previous segment we can draw the following broad and general conclusion: there is a disagreement regarding the utility of creating rights over inventions, yet humanity is entrenched in the current global system. To introduce proportionality in the current system is, assuming the system's main characteristics are impossible to change, compatible with both sides of the divergence. From a global theoretical perspective, stripped from nationalisms (the analysis of the advantages for a particular country), there conceptually will be motives to introduce proportionality for those in both poles of the divergence (and those in between), if the change does not increase the size of the "mistake" (in this context the "mistake" will be defined differently by those in either pole of the divergence), and if at the same time offers any additional advantage.²⁵ If there is not an additional advantage, an academic will at least remain indifferent. The good news for the proposal is that proportionality does offers additional advantages.

According to the proportionality proposal, innovators will receive *at least* the same reward as currently allotted, with a potential for increased revenue from the proper application of patent's rules.²⁶ Also, the main source of economic

²⁵ For a complete review of the axiological justification of this proposal, taking in account the positions of developed and developing countries, *see* DONOSO, A GLOBAL SOLUTION, *supra* note 1. The analysis in that study was developed based upon a triple validation criterion of the examined regulation, intending to unravel the justice, validity (its applicability) and effectiveness (understood as the ability of the rule to achieve the intended result) of the global patent system. If all of these potential properties of the rule are present in a given regulation, the rule achieves an optimal impact on society. Italian philosopher and historian, Norberto Bobbio, championed this way of analyzing regulations in some of his academic production (his main works have not yet been translated to English). In a very basic explanation, he states that when facing any regulation we can establish a triple order of problems: 1) if it is fair or unfair; 2) if it is valid or invalid; 3) if it is effective or ineffective. Put differently, regulations pose three different problems: one of justice, one of validity, and one of effectiveness. NORBERTO BOBBIO, *TEORÍA DE LA NORMA JURÍDICA* at 45-55 (Jair L. Viera ed., EDIPRO 2001) (1993), *available at* http://www.estig.ipbeja.pt/~ac_direito/BobbioNorma.pdf.

²⁶ From stage one of the application of this hypothetical system, firms that produce new technology will be better off due to the overall decrease in deadweight loss (an intrinsic advantage of the proportionality system, that entails more sales), plus a smother "collection" of that reward since it will be increased, as a compensation for shorter periods in poorer countries, in countries in which enforcement is typically done properly (an exogenous advantage of the system). More should be done to generate a proper application of the regulation in a worldwide scale (stage two). The agreement not to use TRIPS non-violation cases in dispute or settlement cases should probably (gradually) end in the face of proportionality (Article 64.2 moratorium,

inefficiency of the system (deadweight loss) will globally decrease, which will be advantageous to the overall global economy, particularly for innovators. Finally, access to new technologies will increase worldwide, which from a social point of view is of enormous importance. Nonetheless, not everyone will be a winner.²⁷ The negative effects created by the patent system will be reduced overall in a global scale, but will increase among the richest countries, proportionally to their wealth.²⁸

Even though the patent as an incentive system is far from receiving unanimous support, there is an agreement on its main problem: deadweight loss.²⁹ “Deadweight loss occurs when people are excluded from using the good even though their willingness to pay is higher than the marginal cost.”³⁰ From an economic point of view there is a net social loss because the sale is not produced. There is also an access problem. Stiglitz puts this in a necessarily crude social context with regard to medicine: “To an economist, this disparity between price

see *supra* note 3). For example, an initiative by the World Customs Organization (WCO) and the World Intellectual Property Organization (WIPO) to permit customs authorities to resolve intellectual property issues *in situ* has been discussed in the past years (7th and 8th WCO Counterfeiting and Piracy (CAP) Group Meetings, Brussels, Belgium, October 23 and 24, 2012 and May 6 and 7, 2013. WIPO, *Recent Activities of WIPO in the Field Of Building Respect For Intellectual Property*, WIPO/ACE/9/2 (Jan. 22, 2014), at 9, http://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ace_9/wipo_ace_9_2.pdf).

²⁷ A very interesting analysis comparing elasticity of public and private goods gives this paper a very applicable, almost ad-hoc, frame to argue for its feasibility. “I find that increases in price greatly diminish the proportion of people willing to pay for consumers goods, such as housing and hardback books; whereas the proportion willing to pay more in taxes to support a public good, such as environmental protection or shelter for homeless, is much less responsive to changes in price.” Donald P. Green, *The Price Elasticity of Mass Preferences*, 86 AM. POL. SCI. REV. 128, 128 (1992). “Thus, not only are economic and political decisions different in character, but the fact that these decisions take place in different environments helps to sustain the schism between the consumer and the consumer’s less price-conscious alter ego, the citizen.” *Id.* at 140.

²⁸ Countries with a higher GDP per capita will have longer periods of protection, thus increasing two problems that the patent system generates (deadweight loss and reduction of the consumer surplus).

²⁹ See EPSTEIN, *supra* note 13, at 10, “The hard social question is whether the law should grant the exclusive right that raises the price above [the] marginal cost. The question would receive an easy affirmative answer if creating this monopoly carried no social price. But unfortunately the price paid comes in the form of dead-weight social losses.” *Id.*

³⁰ SCOTCHMER, *supra* note 8, at 36.

and production cost is simply an economic inefficiency; to an individual with AIDS or some other life-threatening disease, it is a matter of life and death.”³¹

Another comparatively less serious problem from the patent system is the reduction of consumer surplus (antitrust laws are mainly devoted to avoid it; patented products’ sales are generally exempted from this regulations, though). Some consumers do not get excluded from using the patented good by paying more for it than the marginal cost. While this raises a distributional concern, it is not a social net loss. “A dollar is a dollar, no matter whose pocket it is in.”³²

Weighing the length of the patent so that consumers with higher income on average have longer periods of protection is the proper solution for dealing with deadweight loss, without affecting the current global reward. This could be done only if the reward that innovators lose in one country through shorter periods is compensated by a longer period in another country.³³ Under this proposal, limiting the time of the patent in poor countries reduces deadweight loss in those countries, evidently, but also increases that loss in the richest countries that will have to give longer periods of protection. The first and obvious justification for this is simply to create a global patent system that includes the proportionality principal found in law in general (taxes, for instance, are a classic example, but not the only one³⁴), but it may be that the world has not gotten to the stage in which such a thing is possible.³⁵

³¹ STIGLITZ, *supra* note 8, at 124.

³² EPSTEIN, *supra* note 13, at 10. “That ... payment is not a *social* loss because any losses to purchasers are exactly offset by gains to the patent holder.” *Id.*

³³ “Because the invention goes into the public domain at the expiration of the patent, the deadweight losses are incurred only for a limited period of time.” EPSTEIN, *supra* note 13, at 11.

³⁴ Another scholar has proposed a classification according to the economic capacity of the various countries in the patent system in terms of maintenance fees and annuities. *See* Lester C. Thurow, *Needed: A New System of Intellectual Property Rights*, 75 HARV. BUS. REV. 94 (Sept. 1997), *available at* <http://hbr.org/1997/09/needed-a-new-system-of-intellectual-property-rights/ar/5>. This proportionality Thurow proposes is being applied to the international filing of patents under the Patent Cooperation Treaty (PCT). Under it, for example, citizens from certain developing countries are eligible for a 90% decrease of the PCT patent application fee (a few years prior, it was a 75% decrease). *See also* PCT FAQs – Question 9, WORLD INTELLECTUAL PROP. ORG., <http://www.wipo.int/pct/en/faqs/faqs.html> (last visited Nov. 19, 2014). (showing a link between the principle of proportionality and the patent system).

³⁵ “If the proposed corrective is introduced in the current regime of protection for inventions, the countries with better economic situation should extend the period of protection for inventions in their territorial constituencies while the poorest countries will see the periods of protection reduced. The insertion of the proportionality principle in the current regime of protection for inventions is a useful tool to correct the system taking into account the claims of both developed

I will show, through an abstract model, that a year of protection in a richer country is more benevolent for the overall global economy than a year of protection in a poorer country. Economic efficiency is, thus, another powerful argument in favor of this proposal. (Equality among contributors in relation to their economic capacity, and the increased probability of a renewed agreement around it, is probably still the most powerful argument.) This is a novel proposal, so there is no previous economic analysis to rely on. Nonetheless, the model seems to accurately describe the reality, given the assumption in which it rests.

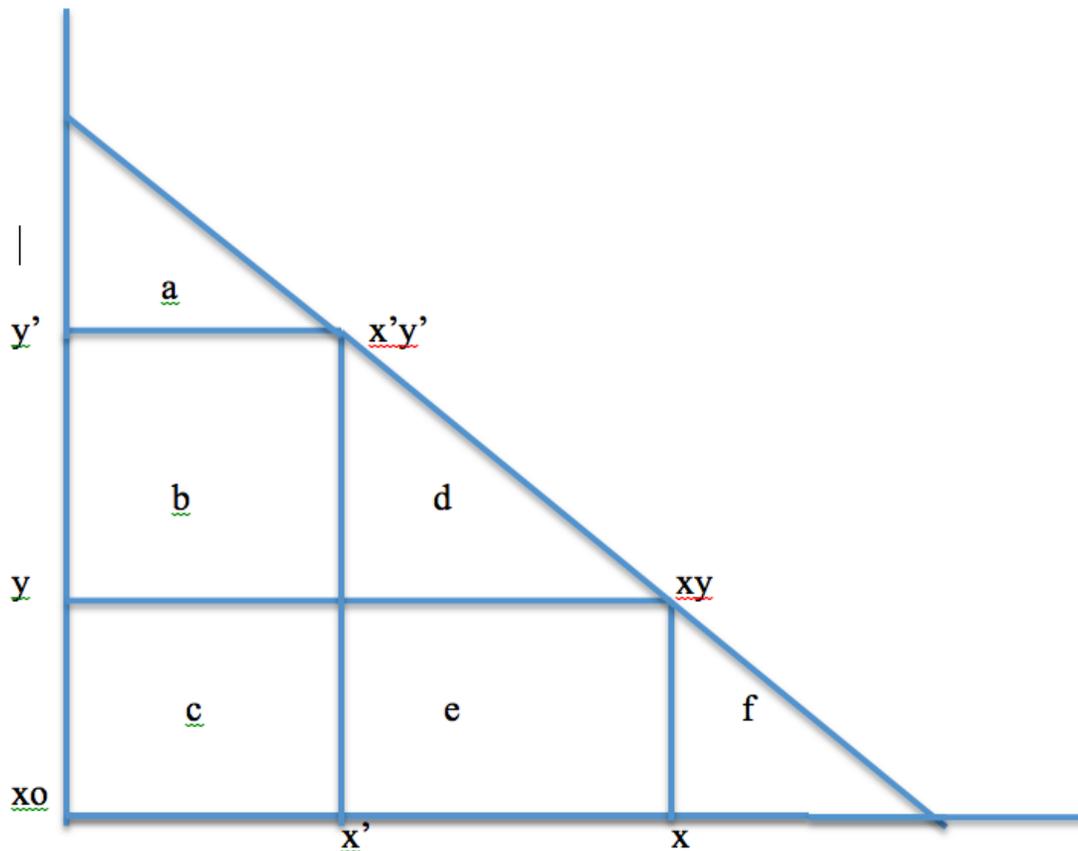
This model addresses the issue abstractly, from an aggregate point of view. The “x” axis indicates quantity, in an abstract way. The “y” axis indicates the average prices paid for technology relative to income, i.e., relative to each country’s average purchasing power. In the model I am assuming the possibility of price differentiation is not presented.. Prices relative to income paid for technology in a richer country will be on average lower than in a poorer country. The elasticity represented below could be any since no specific values are given in the “x” and “y” axis, and, more importantly, the result is always the same with whichever elasticity the demand curve could have. If two countries have the same number of habitants, and one is richer than the other, all other things equal, the exclusivity in a poorer country will produce more deadweight loss than in the richer country.³⁶ In the case of a higher average price paid in relation with income, less quantity would be sold. At a price “y” (for the poorer country), the quantity will be “x’.” For a lower price “y” (for the richer country), the quantity will increase at “x”.

Deadweight loss for the richer country is represented by area f. Deadweight loss for the poorer country is represented by areas d, e, and f (it is always less for

and developing countries, although the populations of developed countries will suffer more years of exclusivity than what they do nowadays and certainly more years of exclusivity than populations of developing countries. [If] more reward means more development ... the key is to have that reward come in a way so that it can be afforded. That being reflected, not only would a proportional justice be achieved, but also an event of global generosity without precedent in the history of mankind would be witnessed. Hobbes’s [sic] theory would be proven wrong, and cohesion of humanity would be envisioned as global. The Achilles heel of the idea presented in this book is that it maybe utopian; it would not be surprising that once again it is proven that *homo homini lupus*.” DONOSO, GLOBAL SOLUTION, *supra* note 1, at 129-30.

³⁶ The area under the demand curve is the consumers’ surplus that would exist at a competitive price of 0. Marginal cost is represented by line xo, assuming 0 cost for reproducing all patented inventions, which is obviously not true (there is always a cost, which is typically much lower than the monopolistic price). This assumption in the chart certainly serves the analysis (if not we should establish a proportion—or percentage—of the marginal cost in relation to the per capita income of each country, that will complicate the graphic unnecessarily).

the richer country). Consumer's surplus that remains is represented by area a in the case of the poorer country and areas a, b, and d in the case of the richer country. The conclusion of this model hold water for all cases in which the demand of the richer country is more inelastic than the demand of the poorer country, since the price is lower for the rich country (thus one side of the triangle that represents deadweight loss will always be shorter) and the hypotenuse (the side opposite to the right angle) will also always be shorter for the rich country (inelastic demand curve is steeper).³⁷ Although it is a simple and static model (it compares two countries at the same moment in time), the model determines a clear and logical tendency.



If the proportionality mechanism is weighed properly, deadweight loss effect could be diminished overall in the global economy. That is why the mechanism I present in this paper uses Gross Domestic Product (GDP) per capita as a weighing instrument. Gross Domestic Product per capita, which reflects an average income of the citizens of each country, is a good indicator of willingness to pay. There are

³⁷ From an aggregated point of view (demand for all technologies) the case in which the demand curve of the poorer country is more inelastic will be rarer since prices have bigger impact in persons with lower income.

other indicators, like purchasing power parity indicators, but more data is available for GDP per capita.

Moreover, for the case of essential innovations protected by patents (life saving drugs, for example), the countries with higher GDP per capita will be better equipped to provide these goods and services for their citizens that otherwise could not access them (depending in each country's policies, of course, but more GDP per capita at the very least gives margin for such a policy). From a social perspective this is huge, plus the sale will take place, limiting even more deadweight loss.

Furthermore, price discrimination and the interaction of this practice with the regime of exhaustion of rights, and the appearance of close substitutes for patented products in the market should be taken into account in order for a complete economic analysis. Up next these issues are revised in light of the proportionality proposal.

1. Close Substitutes

Both deadweight loss and reduction of consumer surplus could be more or less acute, depending on whether the patented good has a close substitute in the market.³⁸ “Moreover, the magnitude of the rents to inventors under a patent system is reasonably correlated with the value of an invention [] monopoly rents will be greater, as indicated, the lesser the extent to which close substitutes for the patented good exist, and the greater the degree to which consumers value it in

³⁸ “The initial model stipulated falsely that every patent holder enjoys *both* a legal and economic monopoly in the relevant market. Functionally, that statement means that buyers have no close substitute for the patented goods. But new entry of rival technologies, patented and unpatented, frequently undermines that assumption.” EPSTEIN, *supra* note 13, at 11. Nonetheless, the cases of “me-too drugs,” “follow-on drugs,” or “inventing around,” for instance, have been looked as an economic efficiency problem, since investment is directed where it is not needed. However, there have been examples of real technical improvements derived from these investments. “Drug companies expend huge amounts of money coming up with drugs that are similar to existing drugs but are not covered by existing patents; even though these drugs may be no better than the existing ones, the profits can be enormous.” STIGLITZ, *supra* note 8, at 110. “In some cases, through better marketing, follow-on drugs have sometimes done as well or better than the original drug. For instance, Zantac was a ‘me-too’ anti-ulcer drug that followed on from the pathbreaking drug Tagamet (based on research that received the Nobel Prize). While some research suggests that Zantac did not, in general, outperform Tagamet, because of better marketing it out- sold it. (Its success may also be related to its having fewer side effects.)” *Id.* at 313 n.18. Consumers value functionality differences even within close substitutes. Moreover, if the market is worth it and the investment is done, this could generate technological competition, creating substitutes, that could tackle the consumer surplus issue.

excess of its cost. Those are precisely the factors that determine the value of an invention to society in general.”³⁹ The exclusivity over inventions must be established by a general rule. It is not adjustable for each specific invention (at least as the status quo is constructed). The market will determine the economic significance of the patented product or service. The proportionality mechanism determines, in a decentralized manner, how many years of exclusivity each country should offer, taking into account its GDP per capita or other similar indicator.

My proposal does not want to change this characteristic (decentralized nature), nor its worldwide, commercially linked, and its one-size-fits-all nature. That is why, under the proposed scheme, cases where the patented invention’s economic transcendence is lost or reduced due to the appearance of a close substitute on the market before the end of its term in all countries, there will not be an exact proportional reward.⁴⁰ This could be an advantage for developed countries in regard to reduction of deadweight loss (the same way that price discrimination could be an advantage in regard to reduction of deadweight loss for developing countries, as we will see up next). As times passes, the probability of a close substitute or a better technology increases. Depending on the technology field, this probability can be higher (e.g. software) or lower (e.g. pharmaceuticals), but this changes from case to case (or can even change as a trend within a given technology, i.e., a breakthrough in a given field could prompt a cascade of innovation). It is impossible to know *a priori*. The innovator assesses the investment, the rule makes no differentiation, and the market determines the outcome.

2. Price Discrimination

A different solution offered to the deadweight loss problem is price discrimination. For the system to be overall efficient price discrimination should globally work together with proportionality as it is commented in the next paragraphs. “The deadweight loss imposed by a monopolist can be mitigated, and possible eliminated, if monopolist can discriminate prices. [...] Price discrimination can go a long distance toward redressing the inefficiency of deadweight loss, but is hard to implement.”⁴¹ If rules to enhance international price

³⁹ See Alan O. Sykes, *TRIPs, Pharmaceuticals, Developing Countries, and the Doha ‘Solution,’* 13 (John M. Olin Program in Law & Economics, Working Paper No. 140 2002), available at http://chicagounbound.uchicago.edu/law_and_economics/597/.

⁴⁰ A close substitute for the patented product could appear and change the patent economic significance, any time before it expires in the country with a higher GDP per capita, which will give the longer period of exclusivity in the world within its circumscription.

⁴¹ SCOTCHMER, *supra* note 8, at 36.

discrimination are adopted, the tendency of more deadweight loss in poorer countries in comparison with richer countries commented in previous paragraphs will be diluted. Proportionality will still be needed, though, not to correct this focus of inefficiency, but to make the system more just (an objective on its own, which could *per se* lead to all the positive things that are mentioned in this paper, as enabling agreements on better enforcement, opening more room for further harmonization, etc.).⁴² If such a change is not possible and international price discrimination continues to be limited, proportionality is even more necessary for the overall efficiency of the system.

Price discrimination consists simply in charging a different price for the same product to different consumers. This can be done in a local/national market, as well as in the international market. Its application in the local market is very complicated due to arbitrage practices (purchasing and selling the same good to take advantage of a price difference), but it certainly can be implemented for some products. This practice in the local/national markets, when applicable (which will depend on the nature of the product), contributes to increase the efficiency of the system by reducing deadweight loss (at the same time it reduces consumer surplus).⁴³

Moreover, if price discrimination could be done in the international markets, deadweight loss could be reduced enormously.⁴⁴ Taking on account the model

⁴² The proportionality system presented in this paper aims to correct the fact that the scheme is currently imposing charges in an inequitable way to all contributors, thus creating resistance to the structure itself and ultimately hindering innovation. Even if price discrimination could be enabled, proportionality is needed. The overall purchasing power differences (the economic differences among countries) will still remain in the presence of price discrimination.

⁴³ The implementation of price discrimination is hard to instrument in local markets. “Our simplified model assumes that the patent holder charges all users an identical price, even if each has a different reservation price. But sometimes a patent holder knows enough about his customers to charge different prices to different classes of users. If the patentee knew the reservation price for each potential buyer, it could sell each buyer just the quantity it needed for a price just below that reservation price. That strategy, if it could be implemented, would eliminate all the deadweight loss (and, of course, any consumer surplus). [...] Apart from any distributional concerns, the total output would equal that under pure competition. In practice, any metering device is likely to be imperfect, as when the sale of toner is used to monitor price differences for printing devices [he cites an example on this regard]. But the overall tendency is still clear”. EPSTEIN, *supra* note 13, at 11.

⁴⁴ Parallel imports means foreign trade could be done outside the official network. This could be very problematic in the pharmaceutical field. Many countries subsidize pharmaceutical products or bargain special prices with drug manufacturers through their public social care provider. Nonetheless, regulated markets, like medicines, seem to be less vulnerable to circumvention. “There are already huge price differences around the world, and only limited

presented a few paragraphs back, if the patent holder choose to apply price discrimination among different countries taking on account their different purchasing power (charging more in one country than in another), there would not be a difference in price relative to income between the two countries. If international arbitrage is prohibited (the exhaustion regime will determine this), the patent holder could take into account the reality of each country, and set a price that is nominally different but the same in consideration to the purchasing power of each country. Because the “y” axis indicates the average prices paid for technology relative to income (i.e., relative to each country’s average purchasing power), if the patent holder chooses to set prices in relation to the economic capacity of each country, the deadweight loss will be the same for both countries. The tendency of more deadweight loss (and restricted access to innovation) that I argue exist in developing countries in relationship to developed countries will cease to hold water.

There are three aspects that must be taken on account in order to properly assess price discrimination in international trade. The first one comes from the essence of intellectual property rights. It is the right of the patent holder to set prices as she wishes with out facing competition (constrained only by market forces, for example, the appearance of a close substitute in the market). The other two are exogenous factors that must be taken on account by the patent holder to make its free decision: smuggling, and the scheme of exhaustion of intellectual property rights chosen by each country. The former is an issue of enforcement. The latter is the regulation choice that each country has to make.⁴⁵

circumvention, largely because this is a highly regulated industry [the pharmaceutical industry], with imports tightly controlled, and with most purchases paid by third parties.” STIGLITZ, *supra* note 8, at 315.

⁴⁵ The developing countries are identified with the theory of international exhaustion, while developed countries have usually established in their legislation regional (European Union) or national exhaustion (with the exception of Japan that generally uses international exhaustion, with a caveat regarding grey market products in which contractual restrictions on importation may apply). “In Japan Tokyo High Court (in 1995) applied the international exhaustion rule (BBS Kraftfahrzeug Technik AG v. Kabushiki Kaisha Racimex Japan and Kabushiki Kaisha JapAuto Prods). The sentence turned over the *leading case* Brunswick (1969, Osaka District Court). According to the Brunswick *case* parallel importation was unlawful if goods were already patented in Japan. Finally, in 1997, the Japanese Supreme Court didn’t use the international exhaustion principle, and decided that holder of a patent in Japan and in another country can’t oppose to importation in Japan of the same product, except demonstrating that the grey market was contractually prohibited (and there was evidence on the product). [...] In the E.U. is in force the European Union exhaustion principle. Goods patented (or marked) traded for the first time in the European Union or in the European Economic Area can be freely traded

The freedom that the patent holder has to set prices means that price differentiation is a possibility, but not necessarily the unequivocal practice. Patents confer its owner exclusivity in the market. In that sense the holder could set whatever price she likes without taking on account competition. If acting rationally, she will set the price that will yield the higher profit. A higher price not necessarily results in profit maximization, if by it the patent holder excludes too many consumers. Conversely, more sales due to low prices not necessarily result in profit maximization either, if the price is too low. The optimal price, with profit maximization in mind, will depend on each product and each market. A patent holder will settle with a combination of price and quantity which yields the bigger profit, taking on account its distribution capacity, the type of consumer (e.g. a firm could have a commercial strategy that comprises establishing a “high end” status for its products), the elasticity of the demand for that product, among many other factors.

Moreover the patent holder faces his own product’s competition in a given market, sort to speak, if parallel imports are permitted in that country (if the country has established an international exhaustion of rights regime, as permitted by the TRIPS Agreement).⁴⁶ In this case, the application of price discrimination by the patent holder is limited.⁴⁷ Let us assume, as economists tend to do to allow analysis,

inside European Union [...] U.S. Government, instead, has been always adverse international exhaustion. During the negotiations of TRIPS agreement U.S. Government expressed his contrary view (with reference to patents and specially drugs). The U.S. Government opinion is founded on the need to defend the research’ possibility of enterprises that want to patent their inventions. Prof. V. Di Cataldo, Parallel importations, New perspectives, available at http://www.google.com.ec/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CB8QFjAA&url=http%3A%2F%2Fwww.wipo.int%2Fedocs%2Fmdocs%2Fsme%2Fen%2Fwipo_smes_rom_09%2Fwipo_smes_rom_09_workshop12_3.doc&ei=qi6UVOrbIYSR8QWtw4D4CQ&usg=AFQjCNEfsdHMTrZCaBl8K5VpLxv4I3qgOA&sig2=93Kaqpsz84Lr3kGBWl6Rgw&bvm=bv.82001339,d.dGc

⁴⁶ The theory of exhaustion of rights is universally accepted. In regard with the scope of its application (the limit of its impact), whether territorial, regional, or international, different conceptions have been established. According to the conception chosen by each country, foreign trade acts that are allowed will be determined. If the limit of the exhaustion is territorial, any export/import of a patented product or a product produced by a patented process can be made only with the consent of the patent owner, as part of an official network. On the other hand, if applying the principle of international exhaustion, acts of foreign trade of the product of a patent may be made by anyone who has lawfully acquired a patented product. Hence, the application of the international exhaustion of rights paradigm is known with the term parallel imports.

⁴⁷ Moreover, territorial or regional exhaustion prevents competition that could arise between the patent owner and licensee, thus keeping intact the exclusive exploitation rights of the first. Otherwise licensees (or even those who legitimately purchased the product) could export the licensed product to the country of origin of the patent holder. This could mean that the patent

that there is proper customs enforcement, no tariffs, zero transportation cost, no transactional costs, and that the patent holder decided to set an international price discrimination strategy that takes on account countries' purchasing power. The market of the richest country among those that have chosen international exhaustion (country x) will set the price for patented products for all countries that are poorer than this one (countries y, z), regardless if they chose international exhaustion or not. Since anyone could purchase the product anywhere in the world and legitimately introduce it to that market of country x, if the price is lower in countries y or z many could take advantage of importing the good into country x. With profit maximization in mind, the patent holder would not set different prices. She would have to set an international strategy that, as a tendency, will generate more deadweight loss and less access to the products in poorer countries.

The obvious solution is to set national exhaustion or regional exhaustion (like the European market) as the international global standard.⁴⁸ This has been suggested in many occasions, but such an agreement has not been possible, because negotiations are currently blocked.⁴⁹ Developing countries, which could benefit from such a change, are probably suspicious of the system. In one hand they worry that if they set national exhaustion, their markets will be undersupplied, which could be addressed with proper regulation. In the other hand, they repudiate

holder has to compete freely in the market for a product on which he supposed to have exclusivity. For these reasons, it seems wise to establish a system of territorial or regional exhaustion. As all the conclusions in this publication, this recommendation is in order provided that the corrective this paper urges comes to be established. Proportionality is the answer for a global, effective, and just system.

⁴⁸ Article 6 of the TRIPS Agreement, despite its confusing wording, leaves the definition of the exhaustion system to the discretion of the different countries. In the absence of a consensus in 1994, the TRIPS Agreement gave countries freedom in regard to this determination in strict respect of the principles of National-Treatment and Most-Favoured-Nation. It is noteworthy that the exhaustion of intellectual property rights is an issue that applies to all intellectual property rights in general and not only for patents, which makes its impact even greater. The suggestions here stated are meant for the case of patents. The subject under discussion is not the right of the holder of a patent to import his product (importation is considered exploitation) or the theory of exhaustion of rights (universally accepted). What has been discussed is the limit of the application of the exhaustion paradigm.

⁴⁹ "If trading nations as a whole ban parallel imports, pharmaceutical patentholders should be willing to sell their products at a low price to nations where customers cannot afford to pay much for them as long as that price covers the marginal cost of making the drug and delivering it. They will be willing to do so because each sale yields some profit, and they need not fear that their low-priced sales in one market will be re-exported to undercut their prices elsewhere. When parallel imports are possible, by contrast, they will likely become unwilling to sell at low prices in markets where demand is weak. Poorer countries may then find themselves largely priced out of the market for particular medications." Sykes, *supra* note 43, at 20.

the idea (almost as a dogmatic believe) of any more power advantages for the patent holder (poor countries are reluctant to trust in the market and its effect on individual decisions; that the patent holder could practice price discrimination under national or regional exhaustion does not necessarily mean she will do it). Price discrimination could certainly be an advantage for the patent holder (more sales could occur and, if well applied, it could lead to profit maximization, that will entail more incentive for innovation), but also and more importantly the overall system will be more efficient. Less deadweight loss and more access could be secured for populations in developing countries. Maybe the only way to change the attitude of the developing world towards patent protection is to renew the justice of the global scheme. Proportionality could lead the way.

In the case of territorial or regional exhaustion, the patent holder will have more control over the international market of her product, while in the international exhaustion case this control will be diluted. A greater control implies more economic rights for the holder of the patent, but it should also imply more responsibility toward consumers.⁵⁰ The proportionality proposal goes together with making territorial or regional exhaustion the global standard to achieve a more efficient system, but it could go even further. Until the patent expires in the very last country (the richest, in GDP per capita), the patent holder should be entitled to know who is using, producing and selling his product elsewhere (where the patent is part now of the public domain).⁵¹ This is not an unequivocally necessary change for the proportional system to work, but it could enhance it.

Lastly, currently patent holders face competition of counterfeited products. If someone infringing the patent produces in a given market a product protected by a patent, there is an unlawful dilution of the monopolistic power. It will also be unlawful if the product is smuggled into the market, even though the product could

⁵⁰ If there is an official network with the capacity to control the acts of foreign trade, the global distribution of the patented product will be done through licensing or self-representation. A product that is introduced as a result of a license or direct sale will better ensure consumer rights. It will mean there will be a local agent or representative of the patent holder, who could respond for the quality of the products.

⁵¹ Paired with this information privilege, as a two ways road, the patent holder should inform the markets she is not attending. It is essential not to have any markets underserved by lack of interest of the patent holder. The information right or responsibility should be bestowed in all international producers alike, not only patent holders. If a given product is found at a market is not supposed to be found, corrections could then be prompted, or eventually sanctions against the producer could be established. It will be easier to control piracy and borders. This will be an important step toward a decentralized control system, which could aid governmental efforts at customs; a necessary step to enforce the varied patent periods between nations.

be legitimately produced elsewhere (where the product is not patented or the patent has expired). Parallel imports generate competition for the patent holder with the patent holder's own product, thus eliminating the possibility of price discrimination. Smuggling and counterfeiting is a problem of a different nature. It is an enforcement problem, and not a regulatory problem. In strict sense, this problem is not going to be worsened or alleviated by the proportionality proposal.⁵² Both a counterfeited and a smuggled product (even though produced legitimately elsewhere) will be unlawful in the jurisdiction where the patent is still enforceable. The solution in both cases is to have better custom control.

B. The Proportionality Mechanism

Some have proposed making the system less than universal as a potential solution.⁵³ This proposal results in a line drawing problem: which countries will be part of the reward?⁵⁴ Both politically and economically (and logically), it makes much more sense to have a proportional reward system.⁵⁵

⁵² One may argue that under the proportionality proposal there will be more cases of smuggling since there will be more products to smuggle available. It all is reduced to custom control, though. This is a key aspect of international trade, which not only pertains patents or intellectual property (efforts of a better customs system will be beneficial in many aspects, and they sure should continue).

⁵³ See STIGLITZ, *supra* note 8, at 120, "One of the simplest ways for the developed countries to help developing countries is to 'waive' the tax, allowing them to use the intellectual property for their own citizens, so that their citizens can obtain the drug at cost. Critics might say: But then the developing countries are simply freeriding on the advanced industrial countries. To which the answer is: Yes, and they should. There is no additional cost imposed on the developed countries." In the same line of thought, one interesting economic analysis has concluded that "under specified circumstances it is not optimal to extend patent protection to all countries of the world." Alan V. Deardorff, *Welfare Effects of Global Patent Protection*, 59 *ECONOMICA* 35, 48 (1992). Based on his analysis, Deardorff argues that "extending this protection to other countries is very likely to be harmful to them, in spite of the fact that they will benefit from increased inventive activity.... a case can be made, in terms of world welfare, for limiting the coverage of a patent protection to less than the entire world." *Id.* at 36. Ultimately, his research demonstrates that "the case for universal patent protection is not a clear one ... and the concerns of some developing countries that they will be exploited by patent protection are not without foundation." *Id.* This happens with the LDCs, which are exempted from the application of the TRIPS agreement provision (which does not give 20 years patents).

⁵⁴ There are currently 48 least-developed countries (LDCs) on the UN list (*see* http://www.un.org/en/development/desa/policy/cdp/ldc/ldc_list.pdf), 34 of which to date have become WTO members, that do not apply the 20 year TRIPS' provisions. "WTO recognizes as least-developed countries ... those countries which have been designated as such by the United Nations.... There are no WTO definitions of "developed" or "developing" countries. Developing countries in the WTO are designated on the basis of self-selection although this is not necessarily

It is a contradiction that people in Canada- as an example of a developed country with an annual income of US\$51,000 per capita- abide the existence of a legal monopoly of twenty years the same way as the people of Ecuador, a country with an income of less than US\$6,000 per capita (2013 data).⁵⁶ Just by stating the above, the inadequate treatment of the regulation is revealed. By applying the proportionality mechanism to this situation, other aspects for the protection of inventions may be analyzed. If reward means technological development or even if it does not, it will be correct for humankind to assume the cost proportionally to each country's capacity.

The reward to innovators is set in years of exclusivity. This proposal entails maintaining the innovators' current reward unaffected. This could be done only if the reward that innovators lose in one country due to a shorter period is compensated by a longer period in another country. To accomplish this, the way to establish proportionality should be creative.⁵⁷ First, it is important to establish a measure of the potential revenue that the world as a whole is currently offering

automatically accepted in all WTO bodies.” *Understanding the WTO – Least Developed Countries*, WTO, http://www.wto.org/english/thewto_e/whatis_e/tif_e/org7_e.htm (last visited Oct. 10, 2014).

⁵⁵ A recent empirical analysis on China's patent applications at the U.S. Patent Office shows a trend that is common to those countries that have walked the path to development. Jay P. Kesan, Alan C. Marco & Richard Miller, *Patenting — With Chinese Characteristics* (Univ. Ill. Coll. Law, Working Paper Series July 22, 2014), available at <http://ssrn.com/abstract=2469957>. This study shows that Japan and South Korea's increase in technological innovation is correlated with their development status (as well as benefits to their population). China is now following their footsteps. Brazil, India and others are, in a lesser way, following that path, but in a slower manner. From this kind of empirical analysis it seems that the world should continue to reward innovation, helping others to develop. India is an interesting case. There is a lot of innovative activity, but the mass of its population is extremely poor (in some years it has a per capita income smaller than many countries in the LDC list). It will enhance their chances of development if their inventions could get proper reward from the world, while their population rewards according to their capacity to do so (for instance, one of Hinduism's main celebrations, Diwali, praises light and knowledge). Countries must contribute according to their capacity, but they should not stop contributing to the overall global retribution. This is not only because they have the aspiration to develop, but also because it will be correct for them to legitimately benefit from technological progress by contributing according to their capacity.

⁵⁶ *Data: GDP Per Capita*, WORLD BANK, <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD> (last visited Sept. 27, 2014) (data is in current U.S. dollars).

⁵⁷ In taxes to establish the measure of contribution of each citizen, there are many alternatives, (e.g., a distributive agenda, to promote investment, etc.). This paper does not seek to provide unequivocal answers. I will just try to provide a mechanism in order for this proposal to be feasible. Of course there will be many alternatives.

innovators (no measure could be uncontested). I have chosen GDP to reflect potential revenue in the mechanism.⁵⁸

Once I settled on a measure of reward (GDP), I have applied it to assess the status quo, which is 20 years of reward for every country (WTO countries that are not in the Least Developed Country list). This is the World's GDP multiplied by the world's reward (20 years). This is the **World's Current Reward**. This amount will have to render the same result under the proposed mechanism, in order for it to be neutral in regard to the status quo. Then, I calculated the current percentage each country gives under the TRIPS's 20 years reward with regard to the World's Current Reward.

I then used a very basic formula to establish the proportional reward that countries should give toward innovation, measured in years of exclusivity. First, for the developing countries (as categorized in accordance with this proposal), the reward will be as so:

$$X = (\text{GDP per capita of each country} \times 20) / \text{World's GDP per capita}$$

Next, I assigned the result to all countries that, according to the calculation, will have to give less than 20 years of exclusivity, until the result reaches as low as 7 years.⁵⁹ Thus, 7 will be the least any country will give (this is a arbitrary determination; a new minimum should be agreed in the international arena).⁶⁰ I

⁵⁸ The economic significance of each invention, as we have seen, depends on many factors. No invention will have the same reward as any other. Nonetheless, they all have a market from which they can extract their reward. A measure of the potential revenue must be established accordingly. I have used GDP per capita to establish the proportional reward, in order to take into account a variable that influences willingness to pay (as discussed in the previous segment). Many other variables could have been used, and no measure will be uncontested.

⁵⁹ This could be too little, especially for pharmaceutical products. According to the Pharmaceutical Research & Manufacturers of America ("PhRMA"), an organization representing biopharmaceutical researchers and biotechnology companies, the "the clinical trials process occurs in several phases and takes on average six to seven years." *What Are Clinical Trials?*, PhRMA, <http://www.phrma.org/innovation/clinical-trials#sthash.Jq3QCHj8.dpuf> (last visited Nov. 5, 2014). It is an arbitrary determination. To start to compute the patent time from the moment of the first sale could be a proper solution. This is not part of the status quo, so it is presented as a simple annotation. As suggested in the conclusion, the solution to the problem of neglected diseases (those that are of primary concern to developing countries) could be to generate enough reward and legal certainty to attract investment toward researching new treatment options.

⁶⁰ I have chosen this mark, because around it LDCs start to appear when applying the formula to the database. And not only Equatorial Guinea and Vanuato, who are graduating (*see* note 64, *infra*), but other LDCs that are doing a little bit better than some that are not in that

then multiplied the GDP of these countries (all that will give less than 20 years) by the number of years of their new reward according to this formula. This, of course, renders a lower amount in comparison to what they gave applying 20 years. This number is the **Developing World's Proposed Reward**. The difference is distributed among the richest countries.

Thus, the **Developed World's Proposed Reward** is determined by distributing the percentage in which the reward should increase in order to cover the damages produced by the application of the proposal to developing countries. These countries carry the same "burden" regardless of their economic condition, because the additional length is directly proportional to their wealth. The damages to innovators from the application of the proposal in developing countries, is the exact amount they recoup by longer periods among the developed countries. Thus, the **World's Proposed Reward** is exactly the same as the **World's Current Reward**.

It is important to recount some basic information of the statistical work I have done in order to obtain the results presented in this paper.⁶¹ The figures calculated use data made available from 1960 to 2013.⁶² I have established which

category (of course, at the end of the list most of the LDCs are piled up with what will be, according to the formula's result, no more than 3 or 4 years of reward, which could go down to less than one year of reward). It is, in any case, an arbitrary determination. Although there are reasons to have such a minimum from the perspective of the producers, the real reason I have chosen to establish this minimum is to tackle the tropical disease and orphan diseases problem, as is discussed at the conclusion of this paper (this is based on the contested assumption that reward spurs innovation). From the producer's perspective, it seem prudent to establish a minimum, since administrative procedures can create long delays before a patent is granted, and because to put a product in the market can also take considerable time (especially for drugs). Something that would be desirable from the producers' point of view is that periods begin to count from the patent grant and not from the filing (as it is now), or even from the first sale (in this eventual system, such a provision could be analyzed, weighing the economic benefits and the patent term). If the duration of the exclusive rights is computed from the administrative decision granting the protection or even with the first sale, certain problems would be avoided (the reward could be really assessed, the data exclusivity issue over clinical trials could be properly evaluated, and unjustified delays in granting a patent would be avoided). Provided the application of a scheme as the one proposed in this paper, this could be considered (it could be weighed when analyzing the optimal patent duration).

⁶¹ See Daniel L. Rubinfeld, *Reference Guide on Multiple Regression*, in REFERENCE MANUAL ON SCI. EVID. 303, 332 (3d ed., Fed. Judicial Ctr. 2011), available at [http://www.fjc.gov/public/pdf.nsf/lookup/SciMan3D01.pdf/\\$file/SciMan3D01.pdf](http://www.fjc.gov/public/pdf.nsf/lookup/SciMan3D01.pdf/$file/SciMan3D01.pdf).

⁶² *Data: GDP Per Capita*, supra note 56. There is no GDP data for Myanmar, Somalia (from 1991 thereon), or San Marino (none of which are WTO members), no GDP data for Nauru and the Holy See, and no GDP per capita data for Democratic Republic of Korea (which is also not a

countries are members of the WTO, which are members of the European Union, and which have the LDC category, and the dates of entrance, from the WTO, EU and UN web pages.⁶³ The results presented in this paper range from 2004 to 2013.⁶⁴ The formula was applied to all the countries in the world (no samples used).⁶⁵

WTO member). There are some other countries which are missing data from 2007, 2008, and thereon (*e.g.*, Andorra and Syria, which are also not WTO members). China is considered separately from Macao and Hong Kong.

⁶³ For a list of countries belonging to the European Union, *see EU Member Countries*, EUROPEAN COMM'N, <http://europa.eu/about-eu/countries/member-countries/> (last visited Dec. 15, 2014).

⁶⁴ The data used for the calculations takes in account the date of entrance to the WTO of each country, and if countries are in the LDCs list (the date of entrance to this list is also considered). For European Union countries, when considered together for the calculations, the year of entrance to the union is also taken in account. This made it possible to obtain a result for different years and to make that result reliable. **NOTE:** The general transition periods explained next were not taken into account, since the figures and charts I present in this paper are based in the 2002-2012 time frame (not all countries used the transitional period to the fullest, so to do so would have required an arduous country-by-country analysis). For the 2002-2012 time frame, the following general transition periods have already expired (for developed and developing countries), while the exceptions for the LDCs are still in place. The implementation of the TRIPS Agreement in the different countries was not immediate in all cases, being gradual for developing countries and LDCs. These are categories included by the TRIPS Agreement, according to the developed condition of the member country based on articles 65 and 66 of the TRIPS Agreement. For all developed countries it was applied since January 1, 1996, but many applied it since 1995. Meanwhile, under the transitional provisions of the agreement, the developing countries were required to comply with the TRIPS Agreement from January 1, 2000, and even LDCs had an additional period of six years. Efforts have provided greater flexibility for LDCs with some concrete results. The decision of the Council for TRIPS of June 2002 established the extension of the transition period under article 66.1 of the TRIPS Agreement for least-developed country members until January 1, 2016, for certain obligations with respect to pharmaceutical products. Decision of the Council for TRIPS of November 2005, which established the extension of the transition period under article 66.1, by which LDC members shall not be required to apply the provisions of the agreement other than articles 3, 4, and 5 until July 1 2013. Just a few months ago came the decision of the Council for TRIPS of June 2013, which extended the transition period previously mentioned, until July 1, 2021. In both of the previously mentioned decisions, the extension period will only apply until the member cease to be an LDC. I have also chosen not to take into account those countries that joined the WTO after 1995, which have their particular transition periods, because their impact is negligible (as discussed in the following footnote).

⁶⁵ Particular transition periods and LDC list inclusions: Up next I present particular transition periods scenarios (sometimes related to the LDC status, thus already considered), which are meant as an annotation to this work. The Russian Federation, which recently joined the WTO (2012), would fully apply the provisions of TRIPs, including provisions for enforcement, without

Truthfully, many issues could arise regarding this mechanism, making it unwise to present it as unequivocal. This is a modest approach by which I have attempted to prove that proportionality could render a feasible result. It clearly does (see the chart and graphic at the end of this paper). A feasible result could also be achieved with the application of different indicators, as well as with different rules.⁶⁶

recourse to any transitional period. *See Working Party Seals the Deal on Russia's Membership Negotiations*, WTO (Nov. 10, 2011), http://www.wto.org/english/news_e/news11_e/acc_rus_10nov11_e.htm. A similar situation is presented by the Ukraine, which joined in 2008. *See Trade Related Intellectual Property Regime*, WTO, <http://ecampus.wto.org/admin/files/ACC/E/M3/Comm/trips/trips.pdf> (last visited Oct. 20, 2014) [hereinafter, "*TRIPs Regime*"], at 9-10. Additionally, Cambodia (2004), Nepal (2004), Lao (2013), and Yemen (2014), which recently joined the WTO (their years of entrance where annotated in parenthesis), are on the list LDCs; of course are given the exception to the application of the TRIPS described in this footnote. Another example is Cape Verde, which graduated as an LDC in 2007 and became part of the WTO in 2008. *See UN Advocate Salutes Cape Verde's Graduation*, UN NEWS CENTRE (Jun. 14, 2007), <http://www.un.org/apps/news/story.asp?NewsID=22918&Cr=cape&Cr1=verde>. A special transition period was agreed upon for Cape Verde: "The representative of Cape Verde confirmed that Cape Verde would apply the Agreement on Trade Related Intellectual Property Rights by no later than January 1, 2013 according to the action plan in Table 12 with the understanding that for the obligations covered by Sections 5 and 7 of Part II of the TRIPS Agreement or to enforce rights provided for under these Sections, Cape Verde would apply the TRIPS Agreement in respect of these obligations no later than January 1, 2016, in light of paragraph 7 of the Doha Declaration on the TRIPS Agreement and Public Health." *TRIPs Regime, supra*, at 8. Such provisions have been agreed upon for other countries as well, such as Tajikistan, Montenegro and the Maldives (which entered the WTO 1995 and graduated from the LDC list on 2011). The Maldives became the third and last country to graduate and be promoted to developing country status (January 1, 2011). Samoa was suppose to graduate on December 31, 2010, but due to the tsunami catastrophe of 2009, its graduations was deferred until January 2014 (General Assembly resolutions A/RES/59/209, A/RES/62/97 and A/RES/64/295. *LDC Factsheet, Samoa*, UN DESA, http://www.un.org/en/development/desa/policy/cdp/ldc/profile/country_164.shtml (last visited Oct. 20, 2014). These cases are simple not considered in the calculations, as their impact is negligible.

⁶⁶ For instance, the LDCs are not considered (the status quo excludes them). If you do include them (part of the proposal is that these countries should give a reward to tackle the orphan diseases issue, as commented in the conclusion of this paper), the difference is negligible in terms of the big picture (the total contribution from LDCs will be less than 0.4% of the total reward). The case of Equatorial Guinea is a peculiar one. Even though it is still an LDC, Equatorial Guinea now has a GDP per capita that puts it in the developed group (it is a special case). Equatorial Guinea recently discovered oil and gas reserves, and thus their per capita GDP rose enormously, to levels that situate it as a developed country. *See Data: Equitorial Guinea*, WORLD BANK, <http://data.worldbank.org/country/equatorial-guinea> (last visited Dec. 15, 2014). However, they are still on the LDC list. General Assembly resolution 68/L.20, adopted on

*C. Expected Consequences of the Proportional System and Technical
Details of the Mechanism*⁶⁷

In the hypothetical system proposed, any holder of a patent shall have the same term of protection worldwide as any other holder of a patent in a subscribing country, regardless of their nationality or the field of technology of the invention. Thus, this proposal is in strict compliance with the theories of National-Treatment and Most-Favored-Nation principles of the WTO. However, “the duration of their rights will vary from country to country, according to the economic capacity of each country.”⁶⁸

Given that the determination of the term of protection a patent is granted would be in relation to a variable factor (GDP per capita), this grant may vary over time. As a result, the frequency of revisions is a matter to be determined under consensus. In the proposed scheme the term each country offers varies automatically every year.⁶⁹

Such flexibility would be a great contribution to the system. The nations of the world could undergo economic crises for various reasons. As such, any country could benefit over the course of history with this hypothetical system (coherent with an axiological perspective), given that in a crisis scenario their inhabitants would see decreases in the period of exclusivity granted to patented inventions in their territory. This kind of solidarity undoubtedly could have a positive impact on the cohesion of humanity. If a country benefits from short-term protection, it will be because it is passing through a bad economic situation. If the struggles are

December 4, 2013, decided that Equatorial Guinea will graduate three and a half years after the adoption of the resolution, and that Vanuatu will graduate four years after the adoption of the resolution. Vanuatu, in contrast, is an example of a country who has seen a far more gradual improvement of their economy. Vanuatu is also an interesting case, though, for other reasons. It recently joined the WTO and is scheduled for graduation. Some think it got a better treatment than some previous members. “Vanuatu was allowed two years to adopt [TRIPS], while Cambodia and Nepal were allowed three years or more.” Daniel Gay, *Vanuatu’s Suspended Accession Bid: Second Thoughts?*, *MANAGING THE CHALLENGES OF WTO PARTICIPATION: CASE STUDY* 43, *WTO* (2005), at n.40, http://www.wto.org/english/res_e/booksp_e/casestudies_e/case43_e.htm (last visited Oct. 20, 2014).

⁶⁷ For a more detailed overview, see DONOSO, *GLOBAL SOLUTION*, *supra* note 1, at 81-107.

⁶⁸ *Id.* at 83.

⁶⁹ *Id.* at 91. The availability of data probably will entail that the term of protection for a given year is determined by data of previous years. In the case of my analysis, 2012 has most of the data for every country. From then on the World Bank page does not provide complete information in its webpage.

resolved and the country improves its economic condition, it would then be in a position to contribute more to the technological progress of humanity. “Consequently the exclusivity period that this country grants to patent holders in its territory [would] be extended.”⁷⁰

This flexibility may also bring some practical complications that must be overcome with specific regulations.⁷¹ There may be situations in which a patent that had expired under a previous exclusivity period would be in a position to recover its availability (or vice versa), which could in turn affect third parties. For example, the ones using or preparing to use an innovation that just became part of the public domain, or those who pay for a license in advance over a patent that is no longer available. In the first case, it seems prudent that if a patent became part of the public domain, it will not recover its availability (this could create some distortions that will run against inventors). The proposal contemplates fractions of a year for the periods of protections, so distortion could be reduced. In the second case, if the fact justifying a license disappears, the contractual obligations of this license will likewise disappear. The proportional system’s implementation will certainly bring these kinds of difficulties.⁷²

An additional positive consequence of the proportionality system could be to achieve technological transfers to the poorest countries.⁷³ A real and effective

⁷⁰ *Id.* at 92.

⁷¹ “In any case, it can be said that once the term of protection that a country is required to provide is known (which may vary according to the frequency in which the reviews are determined by the rule), the status of a particular patent will be known (if the patent is enforceable or if it has become of public use in that particular country).” *Id.*

⁷² *Id.*

⁷³ “[T]echnology transfer is an objective that the current regime has failed to achieve. Even though technology transfer is a value referred to in the statement of principles and objectives of the TRIPS Agreement, this goal is not met in a complete way by the current regime. It has even been argued [by some of the most forceful critics] that the currently conceived system perpetuates the differences or the technology gap between the developed and developing countries, ensuring access to the system only by the powerful... The tools that the agreement foresees to ensure the goal of technology transfer have proven to be ineffective. For example, article 66 of the TRIPS Agreement determines that developed members shall provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least-developed countries (this is a category established by the TRIPS Agreement), to enable them to create a solid and viable technology base.... As a result of this, so far the principle of technology transfer has been merely declaratory, except for certain programs conducted by some industrialized countries to support other less fortunate ones. From the perspective of developed countries—if this hypothetical system came to be implemented—the resources destined to these programs (those of article 66 of TRIPS) could be better used to increase their own poor populations’ access to new technologies, especially regarding health.

transfer of technology to those who need it the most could be achieved, under the principle of proportionality in conjunction with the global principle of free movement of the goods protected by intellectual property rights and recognized by the TRIPS Agreement. With the introduction of proportionality into the current system, the transfer of technology could stop being subject to the charity of the technological owner alone. This has not solved the technology gap. With the proposed system, the period of protection in the poorest countries will be shorter, so free competition could encourage local as well as multinational enterprises to set up technological business in these countries. Moreover, in the place where an intellectual activity occurs, it is effectively transferred, thus ensuring that the disclosure meets its real goal—positive impact on the body of knowledge for mankind. Under this hypothetical scenario, the global free market could attract industries to these countries in which new inventions could be exploited freely.⁷⁴

The discontent with the system of protection of inventions has even gone to the point that Thurow has asserted that the path to development is in disrespecting intellectual property rights: “copying to catch up is the only way to catch up. Every country that has caught up has done it by copying. Third World countries know that unless they can acquire the necessary knowledge, they will never make it into the First World. They cannot afford to buy what they need—even if those who have the knowledge were willing to sell, and they are not. So they have to copy.”⁷⁵ In the light of proportionality, the discontent will not have to be resolved by cheating.

In accordance with the principle of the TRIPS Agreement under which the importation of a product is considered an exploitation of the same, competitors in a given industry could be interested in establishing their presence in the poorest countries to advance efforts to produce technology released earlier under this system. Eventually they could export to the rest of the world, waiting for the gradual release of the patent worldwide. Everyone could produce freely (in that particular market) the new advancements of humankind, thus supplying that market first and then exporting from it to other countries when the patent term has

Technology transfer, as it is established, is a rule that aims to capture an important goal, but because of its poor axiological content (justice), it has become a mere romantic statement.” *Id.* at 95-98 (internal citations omitted). “If the proposed scheme came to be implemented, in which the exclusive exploitation of new technologies will last longer in the circumscriptions of developed countries, it is probable that the governments of those countries would chose to destine resources to aloud [sic] their less privileged population to have access to new technologies, especially when it comes to medicines. Resources could be those of article 66 of TRIPS.” *Id.* at 98 n.70.

⁷⁴ This is true only for that market, and those where the patent has expired; the key for this system to work properly is tight international trade control of protected products. *Id.* at 97-99.

⁷⁵ Thurow, *supra* note 36.

expired. The proposal contained in this study could help to establish a real technological transfer system, fulfilling a basic objective of the patent system. If this proposal comes to be implemented, in order for it to work optimally, a territorial (as opposed to international) exhaustion system should be established as the global standard.

CONCLUSION

I started this paper with a statement: to completely change the system is an unrealistic dream. Although the malleable nature of intellectual property conceptually permits it, the strong status quo precludes it. Thus, I focused the analysis only in the introduction of proportionality into the current system.⁷⁶ Nonetheless, if the world could agree to apply a mechanism like the one proposed in this paper (or any other that render a proportional reward), maybe we can dream again. I believe that a major reform could be constructed around proportionality.

Scholars have addressed many issues of the system of invention protection, and clever solutions have been proposed that should be taken into consideration if a proportional reward opens the way to further consensus.⁷⁷ I will indulge myself by stating only two ideas in this conclusion, of the many possible additional reforms that could be envisioned after proportionality. The first relates to a concrete alarming deficiency of the current system: orphan or neglected diseases.

⁷⁶ In that sense, the last few paragraphs of segment III addressing the exhaustion of rights, as well as a couple of footnotes throughout the article, tackled issues that were set outside the scope of this paper.

⁷⁷ For instance, to address the issue of patent thickets (an issue classically addressed by patent pools), some have called for a scheme where, for the case of technologies in which patents have proliferated (and thus created the thicket), preliminary injunctions are not used to prevent infringements (only to preserve evidence). This will create a system in which infringements are compensated after the fact, but the use of the technology is not hindered. For example, a proposal by Ecuador was presented in 2013 to the Council for the TRIPS, seeking technological transfer of “eco-technologies” by establishing exceptions and limits to the protection of such inventions. Although well intentioned, the proposed solution is incorrect. Less retribution for this kind of technology means less investment in research and development (and unequal share of the mistake among countries, in the case assumption of exclusivity does not spur innovation). More green or eco-technologies could only be further encouraged if the retribution is bigger. If proportionality came to be introduced, a different retribution (longer term of protection) could even be analyzed and established for this kind of technology. Many other issues have been addressed by the literature, such as efforts at evergreening, me-too drugs and patent races (*see supra* note 42), and lack of recognition of ancestral knowledge of indigenous peoples (the Brazilian position on the issue, which implies a requirement of disclosure in the patent application, is probably the way to address it), among others.

The second is a very brief statement of an ulterior and broader dream: a global patent.⁷⁸

The only way for new drugs to be developed for orphan or tropical diseases is for investments on these drugs to be rewarded. Only developing countries' markets could do so. A deep study of the relevant market for these kinds of diseases should be provided to reach necessary conclusions, but these potential markets could be attractive enough if the conditions for reward are improved. Developing countries have been advised to award compulsory licenses, establish exemptions to the patentability, and be very strict with patent examinations. As the system is now conceived, this was probably the wise way to act, although it did not create an incentive for investment in needed areas.⁷⁹ This consideration could be extended to innovation other than drugs, but the need is not felt so strongly elsewhere.

If the previous is acknowledged by developing countries and the system ceases to be perceived as harmful (or at least to be perceived as unequally harmful), the path to further consensus could be opened. To achieve the dream of a single global patent, only one administrative procedure and one global administrative authority to grant a patent and make it available in a global scale should be available.⁸⁰ To walk toward a single global patent, consensus over the

⁷⁸ This could bring a dramatic reduction on filing cost and fees (even litigations cost if the international authority could ventilate some patent disputes in a administrative sphere). The benefits would be enormous. Small innovators could in a better way access a global protection. Where could the dream take us? The World Health Organization doing the work that the Food and Drug Administration does in the United States, in regard to drug commercialization approvals, for the whole world? It is advisable to stop not to get carried away by an overdose of enthusiasm.

⁷⁹ "But there is another possibility, one which in my view better accords with what we know about the importance of patents to pharmaceutical research, and with the extraordinary value to consumers of medicines that successfully treat serious conditions. Developing nations have long had little intellectual property protection for pharmaceuticals, and we have concurrently witnessed an apparent dearth of research into the diseases of particular importance to them such as malaria and drug-resistant tuberculosis. The lack of patent protection may have resulted at least in part from an acute collective action problem—developing nations reap the full benefits from lower prices when they do not create pharmaceutical patents, yet the costs in terms of diminished research incentives are largely externalized to the rest of the developing world." Sykes, *supra* note 43, at 3.

⁸⁰ The Patent Cooperation Treaty (PCT) of 1970, which was amended in 2001, and the Patent Law Treaty (PLT) of 2000 are examples of significant progress on harmonizing the procedures for the filing and granting of patents, but these are far from establishing a global registration procedure and do not further determine the definition of novelty, inventive step, and utility/applicability. Also, these agreements do not have the universal acceptance that the TRIPS

definition of prior art, novelty, inventive step, and utility should be present worldwide. In the proposed hypothetical system, the negative effect from a legal monopoly will be felt proportionally in relation to the economic capacity of each country and its people. All the countries in the world will shoulder the burden of protection equally in proportion to the economic capacity of each country, so the weight of the burden could be collectively decided.

The same will be true for the exceptions and limitations to patentability, which in the current system may be established.⁸¹ From the economic point of

Agreement has. Future efforts should aim to build a stronger international system for granting patents, which, unlike the PCT and PLT, is universal and definitely linked to the TRIPS Agreement. (This is not the case of the aforementioned international instruments.) “On June 2, 2000, the Patent Law Treaty (PLT) was signed by 43 countries, with the support of the United States and the European Patent Office. The PLT does not contain substantive provisions. It rather harmonizes procedural requirements and steps: what may be required to obtain a filing date (Article 5), what may be required relating to the form and content of an application (Article 6), representation before a patent office (Article 7), various issues regarding communications (Article 8), what constitutes sufficient notification (Article 9), validity of patents if not in compliance with certain formal requirements (Article 10), relief in respect of time limits (Article 11), reinstatement of rights (Article 12), correction or addition of priority rights (Article 13). The PLT provisions should help to reduce the risk of errors by patent offices, and the time and costs of procedures for patent applicants, thereby facilitating the acquisition of patent rights internationally. The PLT also provides a clear linkage to the PCT for current and any future patent law harmonization (Article 16).” Carlos M. Correa, *An Agenda for Patent Amendment and Harmonization for Developing Countries* (Sept. 24, 2005) (unpublished, prepared for the Int’l Ctr. for Trade & Sustainable Development’s Bellagio Dialogue), *available at* http://www.wipo.int/meetings/en/2006/scp_of_ge_06/presentations/scp_of_ge_06_correa.pdf.

⁸¹ This could be illustrated by a hypothetical case. Imagine a new kind of technology at the moment unknown for human kind discovered in one of the traditionally inventive countries (where typically innovation take place), which opens the door for exponential technical development that will enormously benefit humanity. Suppose that this new kind of technology has certain characteristic that does not unambiguously determine its patentability under the TRIPS’ rules (almost always the developing countries bring up issues regarding the patentability of new kinds of technologies). Without proportionality, developing countries prefer to declare that this kind of technology is not patentable (they see that the benefits are not worth what they pay for it), and benefit from the innovation anyways, since the developed world is rewarding it (typically the developed do not apply exceptions and limitations). If proportionality is present in the international scheme as this paper argues, the interest of rewarding innovation in this new field (which arguably will entail benefits for the human kind), would not be constrained, as it is now, by economic considerations. The inverse will happen if the patentability of a technology field is not bringing much benefit to humanity. It would not be as easy for the developed world to urge for its protection, since the period of protection in their circumscription will be longer. With proportionality reward, all countries know that exclusivity over this technology will “hurt” all countries equally, in relation to their wealth. If the “burden” is shared, it is more likely it will

view, as the system is now conceived, developing countries find a restricted scope of protection convenient. Ethical implications have been used as a strong argument to dismiss the patentability of biotechnology, for example. It has become the main bargaining tool for developing countries to maintain this exception. Ethical opposition to this kind of innovation has profound goals. On the other hand, the potential benefits that could come from research and development in biotechnology are huge. A serious debate on this issue will be possible if the economic consequences of its conceptualization were to be assumed proportionally by the different countries in application of the proposed proportional system.

In a proportional system, it is in the best interest of all countries that the scheme works well. As innovation will be a truly cooperative effort, it will be important to ensure that all cooperate accordingly and to avoid the typical free-rider problem. In that spirit, the system could compensate inventors for improper applications of the regulation. Thus, penalties could be established in the form of longer periods of protection for those countries that do not protect patents in a suitable way. Moreover, such a model, could also weigh the exceptions and limitations adopted by each country under the TRIPS Agreement. A deep economic and legal analysis will be needed. This analysis should address the following issues: the determination in each country of the novelty, inventive step and industrial application concepts; exceptions on the patentability that have been used in some countries under the TRIPS provisions (*ordre public*, health, environment, biological material, plant varieties, discoveries, “second-use patents” and, diagnostic, therapeutic, and surgical methods);⁸² exceptions and limits to the

be agreed upon. The TRIPS Agreement pertaining all the fields of intellectual property (not only patents) regulates “rights enumerated explicitly, which gives it a certain rigidity, that has been criticized by some who would have preferred it to cover not only all rights included under the term intellectual property, but to those not specifically mentioned.” DONOSO, GLOBAL SOLUTION, *supra* note 1, at 74 n.56 (citing Baldo Kresalja, *El Sistema de Patentes Después del ADPIC: Comentarios y Reflexiones Sobre Su Futura Eficacia*, 4 TEMAS DE DERECHO INDUSTRIAL Y DE LA COMPETENCIA 180, Propiedad Intelectual en Iberoamérica, Buenos Aires: Ediciones Ciudad Argentina (2001); Emery Simon, *GATT & NAFTA Provisions on Intellectual Property*, 4 FORDHAM INTELL. PROP., MEDIA & ENT. L.J., 267, 276-77 (1993)). Regarding patents, for instance, proportionality could be paired with such a provision, so to strengthen the principle by which patents should be granted in any field of technology (article 27.1 of the TRIPS Agreement), and to limit exceptions and limitations. An alternative that will be coherent with the proportionality proposal is to keep the system as it is in regard to exceptions and limitations, but to weigh them embedding in the proportionality formula an indicator for the exclusions and exceptions to the patentability. This, as explained in the introduction, will be a further step towards the implementation of the proportionality proposal, which is not engaged in this paper.

⁸² A distinction is made by some countries between discoveries and innovations, prohibiting the patentability of the latter.

rights conferred by a patent (*ipso iure* limits, compulsory licenses, exhaustion of rights and parallel imports); and clinical trial and data exclusivity in pharmaceuticals.