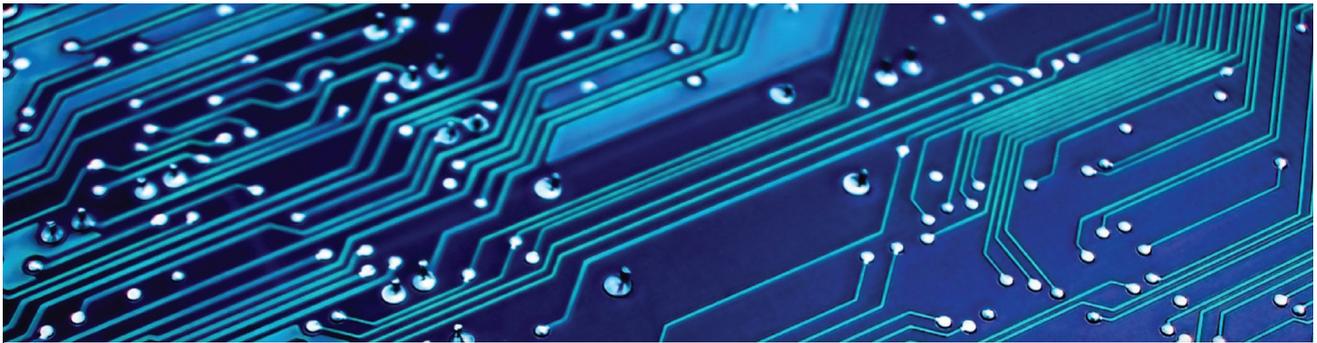




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STRENGTHENING THE GLOBAL TRADE SYSTEM



TRIPs, Patents, and Innovation: A Necessary Reappraisal?

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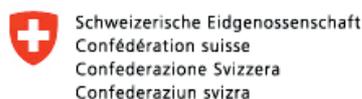
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ABSTRACT

This think piece examines the issue of patents and innovation in the light of both the TRIPS Agreement and the available evidence. After reviewing the *raison d'être* of the TRIPS Agreement, it focuses on what can be done within the confines of the WTO to ensure that patent protection stimulates innovation, and that the benefits are in balance with social costs. Towards this, it explores four alternatives to the status quo that would place innovation at the core of the TRIPS Agreement. The think piece concludes with recommendations that should be part of a long-term vision to promote innovation, but emphasizes that the discussion and research for this should begin today.

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INTRODUCTION: WHY INNOVATION AND THE TRIPS AGREEMENT

Intellectual Property Rights (IPRs) are often viewed as a reward for creation and innovation. Without IPRs, it is widely believed there would not be sufficient incentive for inventors to innovate and create. This link between the incentive, IPRs, and innovation/creation is particularly strong in patents for capital-intensive sectors and sectors where the marginal costs of imitation are low.

Economic literature is now beginning to call into question the long-held assumption that patents promote innovation. The evidence tends to suggest that for most forms of technology and business interests, higher levels of patent rights may even be impairing innovation. Moreover, notable intellectuals are beginning to question the current system. For instance, American jurist Richard A. Posner recently wrote “there appear to be serious problems with our patent system ... and both the problems and the possible solutions merit greater attention than they are receiving” (2012). While Posner was speaking in the context of the domestic system, his comments equally apply to the international system. In this wider context, Nobel laureate in economics Joseph Stiglitz bluntly states that a “poorly designed intellectual property regime ... can actually impede innovation” (2008).

This literature should at the very least result in a re-evaluation of the role of the World Trade Organization's (WTO) Agreement on Trade-Related Aspects of Intellectual Property (TRIPS Agreement) in promoting IPRs, and its relevance and impact on innovation. Indeed, if a re-evaluation of the role of patents indicates that they do not generally promote innovation, or if the value of protection is outweighed by costs, a re-thinking of the tenets of the international IPR system is in order.

With the world struggling to recover from the global financial crisis of 2008, the time is ripe to begin thinking about the proactive steps the WTO can take to stimulate not only trade flows, but also growth and economic development. In this context, discussion on innovation and the WTO is important and opportune. It is worth noting that, in November 2012, the topic of “intellectual property and innovation” was added for the first time to the agenda of the TRIPS Council, based on a joint request by the United States (US) and Brazil (TRIPS Council 2012). At the November 2012 session of the Council and subsequent sessions, it witnessed animated exchanges

on this topic, which confirmed the relevance, timeliness, and importance of reappraising the effect of TRIPS and patents on innovation. Further, several countries, including Australia, Brazil, New Zealand, and South Africa, have commissioned reports and are in the process of reconsidering their patent laws in the light of their individual innovative capacities, economic development, and priorities.

This think-piece examines the issue of patents and innovation in the light of both the TRIPS Agreement and the available evidence. After briefly reviewing the origins and *raison d'être* of the TRIPS Agreement, Section 2 provides a snapshot of the evidence on patent protection and innovation. Section 3 explores four potential responses that would place innovation at the core of the TRIPS Agreement. Section 4 concludes with comments and recommendations.

KEY ISSUES AND CHALLENGES

THE TRIPS AGREEMENT

After much controversy and debate, the TRIPS Agreement became one of the “new” agreements in the WTO. Prescribing minimum substantive and procedural standards, the impetus for the inclusion of an international IP agreement in the WTO was driven by developed countries and related interests, who wished to tighten standards and enforcement norms in developing countries (Sell and May 2005; Matthews 2002). The TRIPS Agreement often has been maligned for this, but the point here is not to cast judgment but to merely call attention to that a direct link between the TRIPS Agreement and innovation is lacking. Simply stated, the objective of the TRIPS Agreement was to increase IP standards and provide for better enforcement, not to increase innovation.

Indeed, innovation as a concept is only mentioned once in the TRIPS Agreement, with Article 7 (“Objectives”) stating,

The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.

While Article 7 states that IPRs “should contribute to the promotion of technological innovation,” the relationship

envisaged under the TRIPS Agreement seems to be one of “co-existence” between IPRs and innovation policy, rather than a more direct or causal relationship. Support for this assertion can be garnered from the placement of the provision in “Part I: General Provisions and Basic Principles,” which perhaps can serve as an aid to interpreting the treaty and potentially guide domestic implementation, but certainly does not provide a justification for IPRs. The only other reference to something encompassing innovation is the fifth recital of the Preamble, which recognizes underlying public policy objectives, including developmental and technological objectives, for the protection of IPRs. If innovation was at the core of the TRIPS Agreement, one would have expected it to feature more prominently in the substantive provisions of the Agreement or at least to be better reflected within those provisions.

On the other hand, the TRIPS Agreement provides for a rather uniform approach to patents, mandating protection “for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application” (Article 27.1). While the TRIPS Agreement does not provide a definition of invention (nor, in fact, innovation), it attempts to harmonize patentability requirements and accompanying exclusions (Article 27.2; 27.3). Thus, a patent is the exclusive right to prevent others from exploiting an invention without the patent holder’s permission. The right is granted for a period of at least 20 years from the date of filing the patent application--thus providing a limited- term monopoly for the rights holder.

ASSESSING AND STRUCTURING THE PROBLEM

The conventional view is that patents provide an incentive to create, thereby leading to enhanced research and development (R&D), and innovation (Mansfield 1986). In this view, patents can be seen as a reward for invention. While the view that patent protection leads to increased R&D and innovation was contested in the 19th century (Machlup and Penrose 1950), it remained essentially unchallenged through the 20th century (but see Penrose 1951; Machlup 1958; Rothbard 1962). The incentive/reward theory is now coming under scrutiny and criticism for lacking empirical evidence and support. While there are numerous studies investigating the correlation between factors associated with IPRs and innovation, there is a dearth of empirical evidence demonstrating a causal relationship between patents and innovation.

It is important to differentiate between innovation and invention. While patents are granted for invention--and there is no doubt that the number of patents granted has grown at a faster rate in the last 20-plus years--this does not necessarily lead to increased R&D or innovation (Barton 2000). Conceptualizing innovation is more challenging.

It can generally be understood as translating inventions into marketable products or services in a practical manner; the absorption of technology by industry; commercialization; and technology transfer. Innovation can thus be understood as the “implementation of a new or significantly improved product (good or service), or process, a new marketing method [for example, a novel product design], or a new organizational method in business practices, workplace organization or external relations” (OECD 2005). The transformation of invention into innovation is dependent on a number of complementary factors, including “organisational changes, firm-level training, testing, marketing and design”(OECD 2005). Thus, while R&D is critically important to innovation, it is only one part of a larger process.

Identifying the factors that stimulate innovation is difficult (Lemley 2000), and attention must be paid to the different kinds of innovation--cumulative innovation; horizontal (basic) innovation; and vertical (applied) innovation. The impact of patent protection can differ on each of these types of innovation. For instance, where cumulative innovation occurs--that is, where a single product may rely on inventions owned by a number of firms--“there is good reason to think that the patent system may discourage innovation overall rather than encouraging it” (Bessen and Maskin 2009; Chu et al. 2012). Shapiro (2001) finds that “with cumulative innovation and multiple blocking patents, stronger patent rights can have the perverse effect of stifling, not encouraging innovation.” In such a situation, multiple licences have to be purchased; uncertainty regarding the status of the technology persists; and the value of patent licensing is questioned (Heller 2008; Boldrin and Levine 2008). Lawsuits become the norm; costs rise as firms defend claims and play the game by defensively purchasing patents; and innovation suffers (Boldrin and Levine 2013; Bessen and Muerer 2008). One only needs to look at the present situation in the high-tech sector to see this cycle playing out, where as much as US\$20 billion was spent in 2010-11 on patent litigation and purchases, and where a “patent tax” of up to 20 percent of R&D costs exists (Duhigg and Lohr 2012).

That a limited monopoly can stifle innovation should not come as a surprise given that competition is generally seen as a positive force in a market economy. Competition is widely thought to provide incentives for the efficient use of resources; motivation for constant progress; and protection for consumers (Vickers 1995). To some, there is an inherent contradiction between innovation and patent protection, as the latter impedes diffusion and obviates potential gains to be made from collaboration and competition (Rothbard 1962; Mises 1966; Palmer 1989; Lemley 2000; Stiglitz 2008). Thus, while Shumpeter acknowledges that competition for innovation led to temporary monopolies and argues that these monopolies were in turn replaced when new firms further innovated (1976), Stiglitz demonstrates that the established monopolies became entrenched as costs and externalities reduced incentives for displacement (Stiglitz and Walsh 2005). In turn, insufficient diversity among

patent holders (a lack of so-called "equilibrium diversity") encourages them to focus R&D on improving existing technologies through incremental improvements, as opposed to investing in R&D to develop new technologies and products (Acemoglu 2011). In essence, this is what the European Commission alleged in its prosecution of Microsoft for anti-competitive behaviour. There, the Commission deemed Microsoft to be a dominant player, which used its near-monopoly power to reduce "talent and capital invested in innovation" in a manner that "limits the prospects for ... competitors to successfully market innovation and thereby discourages them from developing new products" (2004).

The negative effect on innovation is exacerbated by a number of factors, including the growing problem of patent thickets. Owing to the "difficulty of determining the boundaries" of patent claims, there are often multiple and competing claims over one or more aspects of an invention--situations which, Stiglitz states, "especially impede innovation" (2008). While patent thickets have existed for more than a hundred years (a patent thicket impeded the development and commercialization of the airplane), they have more recently become particularly widespread in the electronics industry (GAO 2013). Other factors, such as defensive patenting and the extortion-like practices of so-called patent trolls, have likewise substantially increased the risk of net welfare loss and less innovation (Bessen et al. 2011; Tucker 2011). Recent studies even find that patent pool arrangements result in reduced innovation by member-firms (Lampe and Moser 2010; Joshi and Nerkar 2011; Lampe and Moser 2012).

Evidence also exists to show that stronger patent protection leads not to enhanced innovation or an improvement in overall welfare, but to firms protecting their interests by advocating even more protection (Landes and Posner 2003). In so doing, firms divert resources away from R&D, and into lobbyists and lawsuits. Boldrin and Levine (2013) refer to this as the political economy effect, where patent protection keeps increasing due to the lobbying efforts of entrenched firms, and without regard to the system as a whole. In their view, such behavior distorts the optimum range of protection and unbalances the entire system.

In conclusion, while it is a certainty that patent protection increases patent applications and the number of patents granted, there is little to no solid evidence that it leads to increased innovation (Boldrin and Levine 2013; Scherer 2009; Lerner 2009; Gallini 2002; Jaffe 2000). Since the evidence suggests that "policy changes that strengthen patent protection ... [do] not spur innovation" (Lerner 2002; UNCTAD 2011), it is unsurprising that "there is widespread unease that the costs of stronger patent protection may exceed the benefits" (Jaffe 2002).

POTENTIAL RESPONSES

To establish the economic significance and value of patents, it is necessary to weigh their social costs against their social benefits. Hall et al. (2012) explain,

In principle a patent will function to increase fixed (and most likely sunk) costs of entry into a market where the invention protected by the patent is practiced. This will reduce entry and therefore competition. From a welfare perspective, this is the price society pays in order to encourage invention and innovation by the initial entrant. What results is a trade off between the interests of the incumbent holding the patent and the potential entrant excluded by it. In the case of patents, policy makers need to come to a view of how much protection to afford the patentee in order to create incentives for R&D.

Given the trade-off between innovation and access, policy should be designed to reach the "optimal scope of IPRs protection"--that is, a "balance between the social benefit of innovation and the social cost of monopolistic distortion" (Nordhaus 1969). It is this balance that some believe is now lopsided.

This section focuses on what can be done within the confines of the WTO to ensure that patent protection stimulates innovation and that the benefits are in balance with social costs. It goes beyond merely describing the available flexibilities offered by TRIPS to Members or analyzing the use of such tools. This work has been done (Mercurio 2013; Declaration on Patent Protection 2014), but does not go to the heart of the issue--that of the link between IPRs and innovation. Moreover, given the definitional vagueness and uncertainty of the boundaries of patent claims and rights, countries have become risk averse and are unlikely to take action that may be viewed as inconsistent with the TRIPS Agreement. The discussion and debate must now move beyond the well-known but little used flexibilities to encompass the broader and more fundamental issue of whether IPRs--and correspondingly the TRIPS Agreement--actually encourage innovation.

In a sense, all the potential responses are radical in that they all require a shift from the status quo and amendment to the TRIPS Agreement. For this reason, none are likely to be feasible in the short, and perhaps even medium, term. This does not mean that potential responses should not be discussed. As the economic data and evidence against the current form and level of patent protection mounts, alternatives will become more realistic options. Radical proposals aimed at promoting innovation deserve to feature in the debate. The remainder of this section raises four alternatives to the status quo for discussion.

PATENT SCOPE AND DURATION

To a large extent, the TRIPS Agreement harmonizes the scope and length of protection that patents provide. While tailoring the criteria of patentability and extending patent protection is possible, the international system sets the perimeters for both the scope and length of a patent. The system does not attempt to differentiate between industries or sectors. In fact, even under the nuanced view on discrimination and differentiation espoused by the panel decision in *Canada–Pharmaceutical Patents*, such differentiation would likely be inconsistent with Article 27.1 of the TRIPS Agreement. While there is scholarly criticism of the panel decision (Declaration on Patent Protection 2014), there is no indication that any future panel will adopt a broader view on the issue.

Whether the current regime promotes innovation is unclear. For instance, one study shows that IPRs in general only increase innovation within a jurisdiction if accompanied by high levels of development, educational attainment, and economic freedom (Qian 2007). The results of this study would therefore suggest that uniform standards may not foster innovation equally, with it benefiting innovation in some countries and hampering it in others. This study compliments legal scholarship asking whether the additional range and period of protection offered by the TRIPS Agreement tips the “balance” in favour of patent holders (Gerhart 2000, 2007). In this regard, Yu views the introduction of a one-size-fits-all system as “a rather ill-advised project” given the vast differences in economic conditions between countries (2014). The legal scholarship is in line with the conflicting nature of the evidence on the relationship between patent protection and increased foreign investment, which is perhaps dependent on the industry, sector, and overall state of development of the host country (Boldrin and Levine 2008; Park and Lippoldt 2003; Maskus 1998; Mansfield 1994; Mansfield 1995).

Different industries and sectors also bring differing IP-related issues with them. For this reason, one economist noted that “patents do not provide strong incentives for innovation, but that their new, complementary roles—definition for technology transfer, strategic uses, securing access to markets, and signaling reputation—are important for innovation in industrialized countries” (Léger 2007). This general statement is accurate, but the complimentary effects certainly differ between and among industries and sectors.

Given the economic studies presented in this think piece, it appears pertinent to revisit the scope and duration of patents by asking a number of questions. Is the same level and duration of protection suitable and desirable for all industries/sectors, and for all countries, regardless of developmental levels? For example, while 20 years of patent protection may be necessary for R&D in the pharmaceutical industry, it may not be appropriate in the software sector, where, in the words of Posner, “after five years, these patents

are mainly traps for the unwary” (Duhigg and Lohr 2012). Likewise, is 20 years of patent protection for pharmaceuticals adequate given that a large proportion of the patent period is over before the product can be marketed? In essence, certain questions must be asked: would innovation be enhanced if the scope and duration of patents were tailored to particular industries, sectors, or developmental levels? Would tailoring benefit industrial development? Would it benefit consumers? Should both process and product patents be available for all patentable inventions? Are uniform standards appropriate for all countries? Differentiation among IPRs and between countries is controversial, and would undoubtedly face strong opposition. But as a systemic matter, one must understand that a one-size-fits-all approach to legal issues and problems has long been recognized to be sub-optimal. More specifically, one must ask why differentiation of IP protection would be so controversial when it would simply align IPRs with tariff protection, where the system does not require uniformity and harmonization, and allows different tariff rates for differing products without raising any non-discrimination concerns.

PATENTABILITY

The scope of what is patentable has drastically expanded over the past three decades, and many share Posner's view that “the standards for granting patents are too loose” (Duhigg and Lohr 2012). By no means is this a new phenomenon. For instance, in 1895, a US patent was granted for a four-wheeled self-propelled vehicle—otherwise known as an automobile or car—which impeded the development and affordability of automobiles until Henry Ford succeeded in challenging it in the US Court of Appeals in 1911 (*Columbia v Suerr* 1911). The trend accelerated in the 1990s with a rise in the number of patents both applied for and granted, with more than a few of dubious quality. For example, the US granted a patent for turmeric in 1993 and basmati rice in 1994 despite their existence and known use for more than a thousand years. It also granted numerous patents for various forms of sealed crust-less sandwiches. While the US is undoubtedly the most extreme case of “loose standards,” it is by no means unique in allowing for the expansion of the notion of a patentable invention.

As stated above, there is no evidence that the increase in the volume of patents has had a positive or beneficial effect on innovation. This is problematic, and the lack of competition in certain sectors could potentially hamper innovation. The problem particularly affects the high-tech sector, with software patents both being controversially granted and used in a defensive, anti-competitive manner. With hundreds of small and seemingly inconsequential patents incorporated into every high-tech gadget (such as a smartphone), the threat to both innovation and competition is worrying. Simply stated, firms are fearful of being served with an infringement lawsuit by the holder of a previously unknown (and obscure) patent. In

many cases, the patent holder does not work the patent but is merely bringing the claim in an attempt to extract revenue. In response, firms often determine that settling the lawsuit with a monetary payment will be cheaper and less troublesome than challenging the claim.

While the media and academic commentary firmly focus their attention on the “loose standards” of patents and the large number of software patents granted in the US, most industrialized and a number of other countries grant software patents in some form. This includes not only technology leaders such as Japan, South Korea, and Israel, but also technology hopefuls such as Brazil, China, and South Africa. Even the European Union (EU), Canada, Costa Rica, and others, which technically prohibit patents on computer programs/software “as such,” regularly grant “computer implemented invention” patents. In the EU, for instance, the words “as such” have in practice limited the prohibition to a handful of claims, and provided an avenue to circumvent the ban with claims the innovation at issue is “technical software” (which the European Patent Office deemed patentable) as opposed to a software patent “as such.” This has created a “mess” with software patents in Europe (Engelfriet 2012), and it is presumed that well over 100,000 patents exist for software on the continent (the European Commission admitted more than 30,000 such patents existed in 2002) (European Commission 2002). A study conducted in 2010 for the World Intellectual Property Organization (WIPO) added its voice of concern, stating, “Given the ambiguous nature of the proviso, it is not surprising that it lent itself to a number of different and sometimes conflicting styles of interpretation” (WIPO 2010).

Despite the unworkability of the European law and concerns expressed by the WIPO study, New Zealand recently deemed software patents to “not be an invention” but added the “as such” disclaimer to its revised laws. While the intent of the legislation is clearly to prohibit software patents, some commentators have interpreted the law as a “decision to allow computer programs as patentable” (Kinzer 2012). Rather worryingly, New Zealand’s lawmakers amended the original version of the text to add the “as such” language—and therefore an avenue to circumvent the intention of the law—due to uncertainty among stakeholders and certain lawmakers, who feared that an outright ban may be inconsistent with Article 27.1 of the TRIPS Agreement (Burgess 2013).

While many believe this type of so-called patent trolling is limited to non-practicing entities, all the major high-tech players engage in such behavior, either directly or through related proxy firms. Recent disputes between Microsoft, Apple, LG, Nokia, and HTC illustrate this troubling trend. Instead of simply competing on price, quality, and style, these firms attempt to restrict competition through lawsuits to gain payment, royalties, and highly prized injunctions. While this could lead to short-term gain for some, with all firms buying and using patents defensively, the behavior will inevitably harm the industry—all the firms will successfully

enforce their patents and be found to be infringing other patents. Competition and innovation lose, as does the greater economy. Lawyers are one of the few parties that benefit. This problem is global. For instance, in 2012, Apple was granted an interlocutory injunction that temporarily blocked sales of Samsung’s tablet computer in Australia in the period immediately before Christmas; Apple, Samsung, and LG have engaged in litigation (and been granted injunctions) in Korea in recent years; Apple and Samsung have recently sought injunctions against each other in Japan; and Samsung continues to litigate infringement claims against Apple in Europe.

A similar trend can be seen in the pharmaceutical sector. Low-quality patents and overlapping claims threaten timely access to medicines and raise costs to the consumer (often governments). Here again, the threat of potentially violating the TRIPS Agreement constrains governments from fully utilizing their policy space and testing the limits of the TRIPS Agreement. When India did just that with a narrow interpretation of an “invention,” both the pharmaceutical industry and several governments reacted with predictable fury—no other government followed India’s lead and amended their laws to narrow the definition of an invention. Less publicized, although potentially with more far-reaching consequences, pharmaceutical manufacturer Eli Lilly is now litigating a claim under the investor-state dispute settlement mechanism of the North American Free Trade Agreement (NAFTA) challenging the Supreme Court of Canada’s interpretation of utility (that is, capable of industrial application). In essence, the claim makes the assumption that the Canadian interpretation is inconsistent with Article 27.1 of the TRIPS Agreement before linking a violation of TRIPS—that is, the prevailing international standard—with a violation of the investment treaty. Efforts to ensure a maximalist view of patent rights in every circumstance do not promote sustainable innovation or maximize the social benefits of patents, but they will continue as long as the interpretive framework remains vague and undefined.

The system needs a recalibration to promote true innovation and lower costs, and to ensure that patents do not unduly restrict competition in the marketplace. This could start by providing some interpretive guidelines on patentability. Article 27.1 of the TRIPS Agreement sets the broad framework for what is patentable by providing that patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application ... Patents shall be available and patent rights enjoyable without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced.

Article 27.1, however, does not define the key terms, leaving Members with a wide scope to draft and implement domestic laws. For the most part, the trend of expanding what is patentable has occurred through expansive interpretations by patent offices and the judiciary.

Interpretive guidelines incorporated in the TRIPS Agreement on the meaning of obviousness and utility could restrict patentability to more deserving inventions. Such guidelines, in combination with domestic action (for example, ensuring the information disclosure sections on patent applications are of an adequate standard, and perhaps more extreme measures such as revisiting the patentability of government-funded research) would be useful in promoting a balance between patents and innovation. Of course, a word of caution is necessary at this point, as in the early-2000s the Substantive Patent Law Treaty failed to set out definitions and harmonize the interpretation of standards, largely because developing countries believed such harmonization would further maximize IPRs and limit flexibilities. This is exactly the opposite of this paper's goal, which seeks to limit the expansive interpretations that have taken place virtually unchecked.

Even more extreme would be to follow the lead of the 64 countries that already prohibit (in some form) software patents (WIPO 2010). Already protected by copyright--the copyright holder can prevent others from replicating part of the holder's code or deriving new programs from that code--software patents prevent programs developing independently and in a different form that produces the same result. To many onlookers, software patents are a step too far, and instead of leading to enhanced innovation have resulted in frustration, obstructed development, and bullying of small startups by bigger firms. Even in the US, to date the most enthusiastic proponent of software patents, there is a growing sense that the balance may have swung too far towards inventors, to the detriment of users and competition (GAO 2013). Jurisprudence in the US generally favors software patents, but is becoming increasingly incoherent. The Supreme Court has recently ruled in a case involving software patents (*Alice Corp. v. CLS Bank International*).¹ However, its decision did not clarify the situation and sidestepped the more important and controversial aspects of software patents.

Many of the proposals for amending the definition of patentability to promote innovation would impact on the traditional nature of territoriality among IPRs. It may still be appropriate for Members to almost entirely determine the scope of patentability, but it also seems fitting to discuss the alternatives in the light of expanding interpretations of what is patentable, and the corresponding impact on innovation. Moreover, and importantly, the uncertainty and ambiguity left by the TRIPS Agreement has led to a maximalist view of protection. Simply stated, those pressing for further protection increase minimum standards, while those desiring to limit it often fail to act because they are uncertain if such a pull-back will be consistent with the TRIPS Agreement.

COMPETITION LAW

The TRIPS Agreement does not pay much attention to the intersection and interplay between IP and competition law. Section 8 of the TRIPS Agreement--consisting solely of Article 40--provides the only substantive treatment of the issue, and even then is limited to anti-competitive practices in contractual licences. Moreover, it merely provides for governmental consultations when there is reason to believe that licensing practices or conditions pertaining to IPRs abuse has had an adverse effect on competition.

Much more could be done to tailor the TRIPS Agreement to better facilitate innovation. For instance, it could be amended to limit patent protection when innovation is unfairly impeded. The terms "innovation", "unfairly," and "impeded" would have to be defined, perhaps taking into account industry and sector differences. While this is arguably already covered in (a broad reading of) Article 40, a more specific language with more concrete obligations and allowances would better promote innovation. Moreover, such a provision would put the onus of ensuring that patent protection does not unfairly impede innovation on the host state. It would likely be of interest to the high-tech and medical sectors, both of which rely on innovation for their continued success.

A PHARMACEUTICAL EXCEPTION?

The most radical alteration to the TRIPS Agreement to promote innovation would be eliminating patent protection. Arguing that increasing levels of patent protection in the past decades have harmed competition and innovation, Boldrin and Levine (2013) state that the elimination of patent protection would make the world economy more productive, and it would have fewer negative consequences than most assume. To these authors, only a few industries rely on patent protection for their continued development. For the majority, Boldrin and Levine say, patent protection essentially equals litigation as a last resort option to maintain a competitive advantage in the marketplace. This normally occurs when a firm's ability to innovate and benefit from a first-mover advantage in the marketplace ceases. Thus, the authors argue that for most industries it is the ability to continue producing and marketing new, popular, and desirable products to capitalize on the first mover advantage that ultimately becomes a long-term advantage (2013). Posner agrees, stating,

In most [industries], the cost of invention is low; or just being first confers a durable competitive advantage because consumers associate the inventing company's brand name with the product itself; or just being first gives the first company in the market a head start in

1 On 19 June 2014, the United States Supreme Court unanimously held that mere generic computer implementation of an abstract idea is not enough to transform that idea into a patentable invention.

reducing its costs as it becomes more experienced at producing and marketing the product; or the product will be superseded soon anyway, so there's no point to a patent monopoly that will last 20 years; or some or all of these factors are present. Most industries could get along fine without patent protection. (2012)

For others, notably the pharmaceutical and chemical industries, the costs of innovation are great, and the costs of imitation low. In such cases, the elimination of patents would likely deter firms from heavily investing in risky R&D (Basheer 2012). Without such investment, innovation would undoubtedly suffer. For these industries, even Boldrin and Levine agree that some form of government intervention is necessary.

This is not to say that the status quo for these industries should be maintained. Scholarship in the economic, legal, and public health disciplines has for some time questioned whether patent protection in its current form provides the proper incentives for research (especially into diseases that primarily affect the developing world), and whether it benefits consumers/citizens/governments (Hay 2008). For the medical sector, numerous alternative incentives have been proposed, including open-licensing (Munos 2006); prize funds (Stiglitz 2006, 2008; Love and Hubbard 2007; Weilbaeher 2009); global health impact (Hollis and Pogge 2008); or some other sui generis system to protect investment and encourage innovation. These proposals have been scrutinized in the literature (Rimmer 2008; Sonderholm 2010), and all have promise as well as drawbacks. Importantly, there does not appear to be any statistically significant relationship between national pharmaceutical patent protection and R&D (Qian 2007). If this is indeed the case, the necessity of patent protection in the pharmaceutical industry becomes even more questionable. In addition, any change would bring additional benefits as the pharmaceutical industry will inevitably be forced to rethink its business plan, decreasing its reliance on patent protection (and in particular patents for incremental advances) and cost-cutting, and promoting product development and innovation.

In spite of this literature, there is a counterargument that patent protection for pharmaceuticals should be extended--both in duration and to specifically allow for the patenting of second medical use--to encourage innovation. Of course, much more empirical data is needed before taking any drastic action in either direction. The conclusions, of, for instance, Boldrin and Levine, need to be tested--how much do firms rely on first-mover advantage for long-term success--and more work needs to be done on the correlation or causal relationship between IPRs and innovation, both in general and in specific industries.

CONCLUSION AND RECOMMENDATIONS

The empirical evidence suggests that increasing levels of patent protection have not resulted in increased innovation. Instead, it has limited competition, and increased the cost of business, to the detriment of the world economy. Innovation has also suffered, as increasing protection has inhibited the ability of many firms to innovate.

Given this evidence, this think-piece concludes with the following comments and recommendations.

1. Conduct further research on the correlation or causal relationship between patents and innovation, including the indirect benefits for innovation that patent protection may provide (Léger 2007).
2. Re-evaluate the purpose of the TRIPS Agreement. As drafted, innovation is not at the core of the Agreement. If innovation is at the core of the spirit of the TRIPS Agreement, a more explicit reference to it and meaningful obligations and standards should be included.
3. Consider adding more detail to Article 27.1 to ensure that it complements, rather than hampers, innovation.
4. Reflect upon whether the current scope and duration of patent protection is suitable for all industries, sectors, and countries, or whether some differentiation would benefit innovation.
5. Consider adding a more direct and enforceable mandate in the TRIPS Agreement on patent protection, competition, and innovation.
6. Encourage open discussion and debate on the role of patents and innovation to allow new ideas and proposals to flourish.

Many, if not all, of these recommendations will face strong opposition, and they should be viewed more as part of a long-term vision to promote innovation. But the discussion and research should begin today. The IPR regime should be designed to promote creativity and reward innovation, and it is important that as the WTO turns 20 years old, interested stakeholders ensure the system is operating as desired. If not, it should be transformed to increase benefits, reduce costs, promote greater efficiency, and better link IPRs to innovation.

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