Global Patenting and its Effect on the Optimal Patent Term in the United States

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ABSTRACT

Patent globalization has arrived. Procedurally, the Patent Cooperation Treaty (PCT) makes it easy for firms to seek patent protection in many countries around the world. Substantively, the TRIPS Agreement has upped the level of patent protection available in these countries. One critically important issue is how patent law in the United States should respond to the increased globalization of the patent system. Specifically, should we reduce the patent term in the United States to compensate for the enhanced potential for patent exclusivity outside the United States? In this article, I develop a new metric which I call the “global patent term” (GPT) and use it to analyze the patenting strategies of three firms in three very different industries – Pfizer, the pharmaceutical giant; International Paper Company, a worldwide leader in paper products; and UNISYS, a large technology services provider. Based on the results of these three case studies, I conclude that patent globalization discriminates. Some firms like Pfizer benefit substantially from the globalization of intellectual property, reaping higher “rewards per invention” in 2009 than they did in 1995, before the TRIPS Agreement took root. Other firms, such as International Paper and UNISYS, did not participate in the global patent revolution to nearly the same extent. Since patent globalization rewards firms in some industries but not others, an across the board patent term reduction in the United States would likely suppress the incentive to innovate at firms that rely primarily or solely on the U.S. patent system to protect their inventions. To firms such as these, patent globalization is not an adequate substitute for long patent protection in the United States. The fact that patent globalization discriminates based on technology suggests that we should seriously consider implementing technology-specific patent terms. For industries in which patent globalization has really made a difference, such as the pharmaceutical industry, the increased “reward per invention” outside the United States should offset any innovation incentives lost by shortening the duration of U.S. patents. For industries that depend on patent exclusivity in the United States but not elsewhere, a longer U.S. patent term may provide the optimum innovation incentives.
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GLOBAL PATENTING AND ITS EFFECT ON THE OPTIMAL PATENT TERM IN THE UNITED STATES

Wesley D. Markham *

I. INTRODUCTION

Patenting has gone global. The Patent Cooperation Treaty\(^1\) (PCT) makes it possible for inventors and firms to seek patent protection simultaneously in many different countries by filing “international” patent applications.\(^2\) As of 1980, only 30 countries adhered to the PCT.\(^3\) By 1995, the number of PCT contracting states had grown to 82.\(^4\) Today, 142 countries have signed on to the PCT.\(^5\) According to the World Intellectual Property Organization (WIPO), the body that administers the PCT, the PCT “postpones the major costs associated with international patent protection” and “brings the world within reach” (emphasis added).\(^6\) In effect, the

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4 See id.
5 See id.
6 WORLD INTELLECTUAL PROP. ORG., PROTECTING YOUR INVENTIONS ABROAD: FREQUENTLY ASKED QUESTIONS ABOUT THE PATENT COOPERATION TREATY (PCT) 16
proliferation of PCT contracting states makes it relatively easy for a patent applicant to pursue *de facto* worldwide patent protection on her invention.

Not only has it become easier to patent around the globe, but the minimum level of patent protection afforded by most countries has never been higher. The 1994 Agreement on Trade-Related Aspects of Intellectual Property Rights, or TRIPS, sets a floor below which intellectual property standards shall not fall. For example, TRIPS requires that “patents shall be available for any inventions, whether products or processes, in all fields of technology,” with only limited exceptions. Additionally, TRIPS mandates a minimum patent term of twenty years, counted from the patent application filing date.

One critical issue worth considering is how patent law in the United States should respond to this global patent revolution. The overarching, even constitutionalized, policy behind the United States’ patent system is to promote the progress of science and the useful arts. This is a laudable goal, but the devil is in the details. Utilizing an intellectual property regime to maximize innovation requires a delicate balancing act. Inventors and the firms for which they work need an incentive to innovate. In the United States, one such incentive is a limited monopoly in the form of patents for

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8 TRIPS art. 27.

9 TRIPS art. 33.

10 U.S. CONST. art. I, § 8, cl. 8.
new and useful inventions. However, every patent takes something away from the public domain, thereby making it more difficult for others to build on prior discoveries. In other words, patents both encourage and discourage innovation. The key to a successful patent system is determining the correct tipping point, i.e., the smallest reward necessary to spur inventors to invent.

One primary variable in this balancing act is the term of patent protection. As noted above, TRIPS now requires countries to provide a minimum patent term of twenty years.\(^\text{11}\) A relatively long patent term is a large reward for an inventor, but it also imposes a high burden on others who wish to use or improve upon patented technology. In the Patent Act of 1790, Congress set a fourteen year term for U.S. patents.\(^\text{12}\) Today, in compliance with TRIPS, a U.S. patent runs for twenty years from the patent application’s filing date.\(^\text{13}\)

In this article, I investigate whether the average “reward per invention” has significantly increased over the last fifteen years, due in large part to the 1994 TRIPS Agreement and the proliferation of PCT contracting states. More specifically, I evaluate whether patent applicants are actually seeking and obtaining more widespread patent protection today than they were at the time of the TRIPS Agreement fifteen years ago. If it has become relatively easy for firms to secure a high level of protection for each invention, e.g., by receiving multiple patents on the same invention in many different countries, the “reward per invention” is high. In a well-functioning patent system, a high “reward per invention” should result in increased innovation. If the “reward per invention” has increased but the

\(^{11}\) TRIPS art. 33.

\(^{12}\) Patent Act of 1790, ch. 7, § 1, 1 Stat. 109, 110.

level of innovation has remained stagnant or decreased, then we might conclude that the current level of patent protection is too high and should respond by reducing the patent term in the United States. A shorter patent term would allow patented inventions to fall into the public domain more quickly, enabling others to take full advantage of the patented technology.

To measure the “reward per invention,” I developed a metric called the “global patent term,” or GPT. The GPT is the sum of the terms of protection of all the patents, worldwide, on a single invention. Of course, not all patents are created equal. For example, a twenty year monopoly in the United States is likely more valuable than a twenty year monopoly in Belgium. To account for this difference in value, each patent term in the GPT calculation is scaled according to the gross domestic product (GDP) of the corresponding country, using the United States GDP as a baseline.

A short hypothetical will illustrate the calculation. Suppose that in 1995, Company XYZ typically applied for patent protection for its inventions only in the United States. In this case, the GPT equals the U.S. patent term, or twenty years. Now, in 2009, suppose that Company XYZ typically applies for patent protection in the United States, China, and Canada. The GPT equals \[(\text{U.S. patent term})(\text{U.S. GDP} / \text{U.S. GDP}) + (\text{China patent term})(\text{China GDP} / \text{U.S. GDP}) + (\text{Canada patent term})(\text{Canada GDP} / \text{U.S. GDP})\], or \[(20 \text{ years})(\$14,204 \text{ billion} / \$14,204 \text{ billion}) + (20 \text{ years})(\$4,326 \text{ billion} / \$14,204 \text{ billion}) + (20 \text{ years})(\$1,400 \text{ billion} / \$14,204 \text{ billion})\], or \[20 \text{ years} + 6.1 \text{ years} + 2.0 \text{ years}\], or approximately twenty eight years.

In this hypothetical, the “global patent term” for Company XYZ’s invention has risen from twenty years in 1995 to twenty eight years in 2009, an increase of 40%. If the patent system is working properly, we would
expect to see a higher level of innovation from Company XYZ as a result of this 40% increase in “reward per invention.” To test whether this is actually the case, we can examine the research and development (R&D) spending of Company XYZ during the relevant timeframe.

The TRIPS Agreement and the steady growth in number of PCT contracting states have arguably facilitated patenting around the globe. If the reward for inventing, as measured by the “global patent term” metric, is greater than it has ever been before, then the level of innovation, as measured by R&D spending, should be similarly high. However, if innovation is lagging in the face of ever-increasing patent protection, the extra rewards are not fostering innovation but rather unjustly enriching some patent holders. If this is the case, we should consider shortening the patent term in the United States.

To shed light on these difficult issues, I analyzed the “global patent terms” and R&D spending of three different firms in three very different industries: Pfizer, a pharmaceutical giant; International Paper Company, a global paper product producer; and UNISYS, a worldwide information technology provider. In particular, I compared each firm’s average GPT and R&D spending in 1995, just after TRIPS was enacted, and 2009, after the proliferation of PCT contracting states and the entrenchment of the TRIPS regime. The results vary widely among the three firms.

Of the three firms, Pfizer has most clearly taken advantage of the increased availability of patents around the globe. The average (mean/median) GPT of Pfizer’s 1995 U.S. patents was 95.7/85.4 years. The average GPT rose significantly to 131.4/108.7 years in 2009. Even excluding U.S., EP, and WO filings, which heavily influence the overall GPT calculations due to their high GDPs, Pfizer’s average GPT increased
from 23.7/22.6 years in 1995 to 29.9/25.7 years in 2009. Not surprisingly, the average number of countries in which Pfizer filed for patent protection rose from 13 in 1995 to 16 in 2009. Additionally, between 1995 and 2009, Pfizer drastically altered its approach regarding where to file for patent protection, turning away from filing in many Western European countries such as Austria, Germany, and Denmark, and towards filing in Central and South American countries such as Mexico, Argentina, and Brazil. For example, 66% of Pfizer’s 1995 U.S. patents had counterparts in Germany. That number fell to 13% in 2009. On the other hand, only 14% of Pfizer’s 1995 U.S. patents had counterparts in Brazil, but by 2009, 72% of Pfizer’s U.S. patents had related Brazilian applications.

The aforementioned data strongly suggests that Pfizer is reaping the rewards of the strong global patent system buttressed by the Patent Cooperation Treaty and the TRIPS Agreement. In turn, we should see enhanced innovation in the form of increased R&D spending by Pfizer if the patent system is functioning properly. In one respect, we do. Pfizer greatly increased R&D spending from approximately $1.4 billion in 1995 to approximately $7.8 billion in 2009. However, measured as a percentage of total revenues, the increase in Pfizer’s R&D spending from 1995 to 2009 was minimal – 14.4% to 15.7%.

If Pfizer was the only company playing the patent game, then it might make sense to reduce the term of patent protection in the United States. After all, the data shows that Pfizer is getting significantly more worldwide patent protection for each invention today than it was before the TRIPS Agreement took effect. In return, Pfizer has only minimally increased its R&D spending as a fraction of its total revenues. This looks a lot more like unjust enrichment than enhanced innovation. And for a
company like Pfizer, which relies heavily on patenting both inside and outside the United States, any harm to innovation that may come from reducing the patent term in the U.S. will likely be offset by the increased availability and strength of patents around the globe. But Pfizer is not the only company in town. Other firms, such as International Paper Company and UNISYS, that rely more heavily on the U.S. patent system and not on patenting in foreign countries, do not benefit nearly as much as Pfizer does from the worldwide patent regime ushered in by the Patent Cooperation Treaty and the TRIPS Agreement.

While International Paper’s average GPT (mean/median) rose from 42.9/20.0 years in 1995 to 66.1/40.0 years in 2009, most of that increase can be attributed to multiple related U.S. patents on the same technology, not higher global patenting activity on the part of the company. Excluding U.S., EP, and WO filings, International Paper’s average GPT remained relatively flat, slightly rising from 4.0/0.0 years in 1995 to 5.6/0.0 years in 2009. The average number of countries in which International Paper filed for patent protection was essentially flat as well – 3.2/1.0 in 1995 and 3.4/1.0 in 2009.

In stark contrast to Pfizer, International Paper does not appear to have benefited from heightened levels of global patent protection. The company simply does not pursue patents in enough countries outside the United States for the TRIPS Agreement and the proliferation of PCT contracting states to make an appreciable difference in terms of innovation incentives. Therefore, reducing the patent term in the United States may have a deleterious effect on innovation at a company such as International Paper, which has already seen R&D expenditures plummet from $111 million (0.56% of net sales) in 1995 to $13 million (0.06% of net sales) in 2009.
UNISYS is in a similar position to International Paper when it comes to patenting on a global scale – it didn’t do it in 1995 and it doesn’t do it now. UNISYS’ average GPT (mean/median) fell from 54.1/20.0 years in 1995 to 42.0/20.0 years in 2009. Excluding U.S., EP, and WO patent application filings, UNISYS’ average GPT was flat and basically non-existent – 1.8/0.0 years in 1995 and 2.8/0.0 years in 2009. In general, UNISYS only seeks patents for its inventions in the United States, so the enhanced global patent protection made possible by TRIPS and the PCT has little effect on the innovation decisions and R&D expenditure incentives at UNISYS. This becomes quite obvious when one considers that R&D expenditures at UNISYS have fallen from $405 million (6.4% of revenue) in 1995 to $102 million (2.2% of revenue) in 2009.

To summarize, not all companies benefit from the availability of strong global patent protection facilitated by the Patent Cooperation Treaty and mandated by TRIPS. In fact, not even all companies that pursue patents benefit from the aforementioned regime. Easy access to strong patents around the globe is advantageous to firms like Pfizer that seek protection for their inventions in many different countries. For companies like International Paper and UNISYS that primarily file for patents in the United States alone, the theoretical presence of strong patent regimes in other countries has little if any practical effect on the companies’ incentives to innovate. Even if it were possible under TRIPS to decrease the U.S. patent term to less than twenty years, an across the board patent term reduction would not be advisable. Such a move would likely have little influence on innovation at firms such as Pfizer because the effect of the shorter U.S. patent term would be counterbalanced by the enhanced innovation incentives provided by increased patent protection in the rest of
the world. However, for firms that believe it to be in their best interest to seek patents only or primarily in the United States, reducing the U.S. patent term might stifle their drive to innovate.

One possible solution to this problem is to set different patent terms for different technology sectors. A relatively short U.S. patent term might provide the ideal level of innovation for industries such as pharmaceuticals in which the typical inventions (drugs) have worldwide profit-making power. In other industries, such as information technology and software, patenting in many less-developed countries just does not make economic sense because the market is so limited. A longer term of patent protection in the U.S. might be necessary to achieve the maximum amount of innovation in technology sectors such as these. By adopting technology-specific patent terms, it may be possible to increase innovation and to bring patented subject matter into the public domain more quickly.

My article proceeds as follows. In Section II, I recount a short history of the patent term in the United States, showing that the patent term is, and always has been, arbitrary and not tied to any economic theory designed to maximize innovation. Section III presents an overview of the TRIPS Agreement and the Patent Cooperation Treaty in the context of global patent protection. Section IV describes my methodology for collecting and analyzing the data necessary to compare the “reward per invention,” as measured by “global patent term” (GPT), and level of innovation, as measured by R&D expenditures per total revenue, from 1995 and 2009. I present the results of the Pfizer, International Paper, and UNISYS case studies in Section V. I conclude in Section VI by arguing that a strong global patent regime only benefits select firms in particular technologies; reducing the patent term in the U.S. would negatively impact
innovation at firms in technology sectors that do not lend themselves to patenting worldwide; and technology-specific patent terms may yield maximum innovation.

II. A SHORT HISTORY OF THE PATENT TERM IN THE UNITED STATES

Like so much of American law, the original duration of patent protection in the United States was borrowed from England. The Patent Act of 1790 provided that the exclusive rights associated with a patent shall last “for any term not exceeding fourteen years.” This fourteen year patent term was modeled on English law, which based its own fourteen year term not on any economic principles, but rather on “the expected training period for two sets of apprentices.” Another commentator suggests that the fourteen year term in England was simply a compromise between parties who wanted a shorter term and those who preferred a longer term similar to the twenty-one year term frequently used for royal patents issued by King James I.

The Patent Act of 1836 made available a seven year patent term extension, above and beyond the original fourteen year term, in certain circumstances. This lasted until 1861, at which time Congress declared that “[a]ll patents hereafter granted shall remain in force for the term of

seventeen years from the date of issue; and all extension of such patents is hereby prohibited.”

Nordhaus suggests that the seventeen year term was the product of a compromise in which it was decided that “2.43 apprentices, or 17 years, would be the proper length” for patent protection in the United States. Another commentator proposes that the change from a fourteen year patent term to a seventeen year patent term was made, in part, because extensions were so common under the old “fourteen plus seven” system. Yet another opines that Congress selected the seventeen year term because seventeen is “the number midway between 14 and 21.”

The patent term of “seventeen years from issue date” remained in effect until the Uruguay Round Agreements Act (URAA) in 1994. The URAA modified the term of patent protection in the United States from “seventeen years from issue date” to “a term beginning on the date on which the patent issues and ending 20 years from the date on which the application for the patent was filed in the United States…” This change was made to bring the United States into compliance with the TRIPS Agreement, which mandates a minimum patent term of at least twenty years, measured from the date the patent application is filed.

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The change in patent term from “seventeen years from issue date” to “twenty years from filing date” sparked quite a controversy. Proponents of the new twenty year term argued that the old term of “seventeen years from issue date” led to “abuse of the system with so-called ‘submarine’ patents.”25 “Submarine” patents are “patents that were deliberately kept under examination for long periods of time while a technology was developed in the market-place, and then allowed to issue and asserted against businesses that had taken the risks and expense of commercializing the technology without knowing that applications to patent that technology had been filed.”26 Calculating the patent term based on patent application filing date rather than issue date eliminates this “submarine” patent problem. Additionally, supporters of the twenty year term noted that so long as patents are issued in a timely manner, i.e., within three years after filing, the “twenty years from filing date” calculation actually yields a longer patent term than the “seventeen years from issue date” does.27 In summary, “[t]here are three main benefits of the twenty-year term: (1) it discourages the incidence of "submarine patents," which exist due to intentionally extending prosecution, (2) it maintains pressure on the patent community to keep pendency down and encourages inventors to promptly obtain a patent to maximize their exclusive rights, and (3) it provides the


26 Id.

27 See H.R. REP. NO. 104-887 (1997) (discussing Hearing Volume No. 104-58, particularly the testimony of Mr. Lehman and Mr. Kirk).
inventor with a thirty-six month window within which to obtain a patent grant, thus extending the life of a patent in 80% of the cases.”

On the other hand, opponents of the new “twenty years from filing date” patent term stressed that that “the variable term, subject to the speed of the PTO, is particularly damaging” because pioneering technology typically takes a long time to evaluate and approve, which results in shorter terms under the new system. They warn that shorter terms and weaker patents under the new twenty year system will reduce the royalties that are the lifeblood of private R&D funds. The biotechnology sector would be particularly hard hit “because the most commercially attractive patents can take over fourteen years to issue.” According to those who oppose the new twenty year term, the “submarine” patent argument is a red herring. Specifically, very few “submarine” patents exist because the majority of applicants do not benefit from intentionally delaying the issuance of their patents.

In order to address the concerns voiced by opponents of the twenty year term, Congress passed the American Inventors Protection Act of 1999


(AIPA).\(^{33}\) In passing the AIPA, Congress recognized that in some circumstances a diligent applicant may “lose years of effective patent term due to delays in the PTO and other circumstances beyond her control.”\(^{34}\) To combat this problem, the AIPA added complex patent term adjustment provisions to U.S. patent law. Specifically, the AIPA “adds a new provision to compensate applicants fully for PTO-caused administrative delays, and, for good measure, includes a new provision guaranteeing diligent applicants at least a 17-year term by extending the term of any patent not granted within three years of filing. Thus, no patent applicant diligently seeking to obtain a patent will receive a term of less than the 17 years as provided under the pre-GATT3 standard; in fact, most will receive considerably more. Only those who purposely manipulate the system to delay the issuance of their patents will be penalized…”\(^{35}\)

Today, the duration of patent protection in the United States remains “twenty years from filing date,” subject to the aforementioned patent term adjustment provisions.\(^{36}\)

The preceding discussion of the history of the patent term in the United States serves to illuminate two important points. First, the chosen length of patent protection in this country has always been, and still remains, rather arbitrary, a product a compromise and historical accident instead of sound economic analysis. The United States initially adopted a fourteen year patent term by copying English law. More recently, a need to comply with the TRIPS Agreement, not any theory of what duration of


\(^{35}\) Id. at 49-50.

Global patenting and optimal patent term will maximize innovation, drove the change in patent term from “seventeen years from issue date” to “twenty years from filing date.” Second, as a practical matter, any proposal that might be interpreted as weakening the patent system in the United States, e.g., an attempt to shorten the patent term, is likely to meet serious resistance.

III. Global Patenting Under TRIPS and the PCT

The Patent Cooperation Treaty (PCT) facilitates patenting on a global scale. The World Intellectual Property Organization (WIPO) administers the Treaty and describes its operation as follows:

The Treaty makes it possible to seek patent protection for an invention simultaneously in each of a large number of countries by filing an "international" patent application. Such an application may be filed by anyone who is a national or resident of a Contracting State. It may generally be filed with the national patent office of the Contracting State of which the applicant is a national or resident or, at the applicant's option, with the International Bureau of WIPO in Geneva. If the applicant is a national or resident of a Contracting State which is party to the European Patent Convention, the Harare Protocol on Patents and Industrial Designs (Harare Protocol), the revised Bangui Agreement Relating to the Creation of an African Intellectual Property Organization or the Eurasian Patent Convention, the international application may also be filed with the European Patent Office (EPO), the African Regional Industrial Property Organization (ARIPO), the African Intellectual Property Organization (OAPI) or the Eurasian Patent Office (EAPO), respectively.

The international application is then subjected to what is called an "international search." That search is carried out by one of the major patent offices appointed by the PCT Assembly as an International Searching Authority (ISA). The said search results in an "international search report," that is, a listing of the citations of such
published documents that might affect the patentability of the invention claimed in the international application. At the same time, the ISA prepares a written opinion on patentability.

The international search report and the written opinion are communicated by the ISA to the applicant who may decide to withdraw his application, in particular where the said report or opinion makes the granting of patents unlikely.

If the international application is not withdrawn, it is, together with the international search report, published by the International Bureau. The written opinion is not published.57

At its core, the PCT process includes five basic steps: (1) the applicant files an international application, (2) an International Searching Authority (ISA), i.e., a major patent office, performs a patentability search on the invention, (3) the international application is published 18 months after it was filed, (4) an International Preliminary Examining Authority (IPEA), i.e., a major patent office, performs an updated patentability search, and (5) in the “national phase” step, the applicant pursues patents based on the international application in the desired countries.38 Because the PCT system is relatively simple, easy, and cost-effective, the “world’s major corporations, research institutions and universities” use the PCT when they pursue international patent protection.39


39 See id. at 3, 13.
The PCT was initially concluded in 1970 and is open to states party to the Paris Convention for the Protection of Industrial Property.\(^\text{40}\) As noted in Section I, the number of PCT contracting states has steadily increased from 30 in 1980, to 82 in 1995, to 142 as of January 2010.\(^\text{41}\) It should be self-evident that more PCT contracting states means easier access to patents around the globe.

The PCT is essentially _procedural_ in nature. Namely, it provides a convenient patent application filing mechanism for those who desire patent protection in multiple countries. By contrast, the TRIPS Agreement sets _substantive_ standards for the degree of intellectual property protection that WTO member countries must provide. Because TRIPS mandates a relatively high level of patent protection, it has “significantly strengthened foreign patent regimes.”\(^\text{42}\)

Regarding patentable subject matter, TRIPS requires patents to be available “in all fields of technology,” with only limited exceptions for inventions necessary to protect morality, public order, life, and health; inventions drawn to diagnostic, therapeutic, and surgical methods; and plants and animals other than microorganisms.\(^\text{43}\) This provision has particular significance in the pharmaceutical field because prior to TRIPS, at least fifty developing countries, including India, Brazil, and Argentina,
did not permit the patenting of pharmaceutical products. This kind of blanket prohibition on drug patents is impermissible under the TRIPS Agreement.

Regarding the duration of patent protection, Article 33 of TRIPS succinctly states that “[t]he term of protection available shall not end before the expiration of a period of twenty years counted from the filing date” (emphasis added). Stated another way, countries are free to set patent terms above twenty years, but twenty years is the absolute floor. This represents a significant change from the pre-TRIPS regime in which “many developing countries had patent terms of fifteen years or less from the filing date of a patent application.”

Unlike many multilateral agreements, TRIPS has bite. All members of the WTO are bound by the TRIPS agreement and its mandatory twenty year patent term and must also comply with any decision rendered by the WTO dispute resolution panel. According to Peter Drahos, “[t]he minute that TRIPS came into force the US began to use the WTO dispute resolution mechanism to obtain compliance with its provisions. It remains to date the biggest litigator under TRIPS.”


46 See id. at 136.

47 PETER DRAHOS & JOHN BRAITHWAITE, INFORMATION FEUDALISM 113 (Earthscan Publications Ltd., 2002).
A full discussion of the events and negotiations leading up to the consummation of the TRIPS Agreement in 1994 is beyond the scope of this article. It is enough to say that the developed world, in particular the United States and “big business” interest groups such as Pfizer, pushed TRIPS onto less developed countries whose representatives were excluded from key negotiating sessions, steamrolled by more experienced negotiators, and/or convinced that signing on to TRIPS would be beneficial to their countries.48

The combination of the PCT’s convenient international patent application filing mechanism and the high substantive intellectual property standards required by TRIPS creates an environment conducive to patenting on a global scale. However, not every firm can or does take advantage of the strong worldwide patent system supported by TRIPS and the PCT. In Section V below, I demonstrate that some companies, e.g., Pfizer, benefit from strong global patent protection while others, e.g., UNISYS and to a lesser extent International Paper, do not.

IV. METHODOLOGY: GLOBAL PATENT TERM AND R&D EXPENDITURES

The patent system is based on a simple principle: if inventors49 are properly rewarded for their inventions, then they will innovate. A patent provides that reward in the form of a limited monopoly, i.e., the inventor’s right to exclude others from practicing her invention for a limited time. The longer the exclusive rights last, the greater reward to the inventor. Therefore, in order to test whether our patent system is functioning properly, it is necessary to measure or calculate two elements: the reward

48 See id. at 108-49.

49 For the purposes of this article, the term “inventor(s)” encompasses the firms for which inventor(s) work.
given to each inventor for her invention (“reward per invention”) and the amount of innovation produced by the inventor. It is difficult, if not impossible, to directly determine the values of these nebulous concepts, so I developed proxies that can be used to approximate “reward per invention” and amount of innovation: (1) “global patent term,” or GPT, as a proxy for “reward per invention,” and (2) R&D expenditures per total sales/revenue as a proxy for the amount of innovation.

A. Global Patent Term (GPT) as Proxy for “Reward Per Invention”

A U.S. patent is not the only reward available to those that invent. A firm may seek patent protection in many different countries for each invention, so the “reward per invention” is most accurately described by a metric that takes the total amount of worldwide patent exclusivity per invention into consideration. I created the “global patent term” to perform that function.

The GPT is the sum of the terms of protection of all the patents, worldwide, on a single invention. All else being equal, patents in more economically developed countries, e.g., the United States and Japan, are likely to be more valuable than patents in less economically developed countries, e.g., many South American and African countries. Therefore, simply adding together the patent terms from different countries without any adjustment will not paint an accurate picture of “reward per invention.” To correct for this discrepancy in value among patents of different countries, each patent term in the GPT calculation is scaled according to the gross domestic product (GDP) of the corresponding country, using the United States GDP as a baseline.
To illustrate how the GPT calculation works, suppose that at t1, Company XYZ only pursues patents in the United States. Since no other countries are involved, the GPT at t1 equals the U.S. patent term, or twenty years. At t2, Company XYZ changes course and files for patents in United States, China, and Canada. The GPT at t2 equals \((U.S.\ patent\ term)/(U.S.\ GDP\ /\ U.S.\ GDP) + (China\ patent\ term)/(China\ GDP\ /\ U.S.\ GDP) + (Canada\ patent\ term)/(Canada\ GDP\ /\ U.S.\ GDP)\), or \([(20\ \text{years})\times 14,204\ \text{billion} / 14,204\ \text{billion}) + (20\ \text{years})\times 4,326\ \text{billion} / 14,204\ \text{billion} + (20\ \text{years})\times 1,400\ \text{billion} / 14,204\ \text{billion})\), or \([20\ \text{years} + 6.1\ \text{years} + 2.0\ \text{years}]\), or approximately twenty eight years.

In this hypothetical, Company XYZ’s GPT, a proxy for “reward per invention,” has increased by 40%, from twenty years at t1 to twenty eight years at t2. In a properly functioning patent system, the amount of innovation produced by Company XYZ should increase as a result of this 40% increase in “reward per invention.” If it does not, then the extra reward obtained by Company XYZ is not serving its purpose.

The data gathering and analysis required to determine the GPT was substantially the same for all three case studies (Pfizer, International Paper, and UNISYS). For purposes of illustration, I will focus on the Pfizer study in the subsequent discussion. To begin, I generated a list of all the U.S. patents issued to Pfizer in 1995.\(^{50}\) I chose 1995 because it represented the switchover period from the pre-TRIPS regime to the TRIPS regime. In other words, patents issued in 1995 represent a nice baseline to evaluate a firm’s patenting strategy prior to the TRIPS Agreement. For each U.S. patent on the list, I located all the patent applications from different countries involving.

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\(^{50}\) To generate the list of patents, I performed an “assignee” search in the USPTO’s U.S. Patent Database, http://patft.uspto.gov/netahtml/PTO/search-bool.html.
countries, worldwide, that are related to the aforementioned U.S. patent. This collection of patents and patent applications is known as a “patent family,” and it roughly represents the worldwide patent protection afforded to each invention.\(^5\)

Next, I reviewed the patent laws of each applicable country to determine the duration of patent protection afforded in each of the countries.\(^5\) I then obtained the GDP data for each country from information provided by the World Bank.\(^5\) I utilized a spreadsheet program to perform the “global patent term” calculations based on all the data I previously collected. Finally, I repeated the process for Pfizer’s 2009 U.S. patents. By comparing the results from 1995 and 2009, I was able to determine the extent to which Pfizer is now taking advantage of the worldwide patent market facilitated by TRIPS and the PCT.

**B. R&D Expenditures as Proxy for “Amount of Innovation”**

As a general matter, innovation is an expensive and risky proposition. The paradigmatic example is new drug development in the pharmaceutical industry. Developing a new drug typically costs between

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\(^5\) I used the INPADOC patent family function in the espacenet worldwide patent interface, http://ep.espacenet.com/advancedSearch, in order to generate the patent family information. INPADOC is a patent database maintained by the European Patent Office (EPO) that contains about 60 million patents and published patent applications from about 80 different countries. See about the extended (INPADOC) patent family, http://www.epo.org/patents/patent-information/about/families/inpadoc.html.

\(^5\) I gathered the patent term information from the World Intellectual Property Office’s (WIPO’s) collection of patent laws by country, http://www.wipo.int/clea/en/. Consistent with TRIPS art. 33, the vast majority of countries have a “twenty years from filing date” patent term.

$500 million and $2 billion.\textsuperscript{54} Success rates are low, ranging from 7% to 28% depending on the therapeutic class of the drug.\textsuperscript{55} For this reason, measuring the “amount of innovation” directly, e.g., by looking at the number or value of new products brought to market by a particular firm, is problematic.

In many respects, a firm cannot control or predict which of its products will become commercially successful and/or provide some net benefit to society. This depends on many variables, including consumer preference, marketing and advertising, luck, timing, and in some cases regulatory approval. Even a perfectly functioning patent system cannot make every product successful. However, a well-run patent system can and should incentivize firms to devote the resources necessary to make innovation possible. In other words, the promise of patent protection should incentivize firms to spend money on research and development (R&D), which in turn leads to innovation. All else being equal, more R&D spending should result in proportionally higher levels of innovation, so using R&D expenditures as a proxy for innovation makes sense.

For example, suppose Pharmaceutical Firm A spends $10 billion/year on R&D while Pharmaceutical Firm B spends twice as much, or $20 billion/year. Assume that developing a new drug, either successfully or unsuccessfully, costs $500 million and the success rate is 20%. Based on


these numbers, a firm must spend, on average, $2.5 billion to successfully bring a drug to market. Firm A, which spends $10 billion on R&D, will develop four successful new drugs each year. Firm B, which spends $20 billion on R&D, will develop eight successful new drugs each year. Since Firm B developed twice as many new drugs as Firm A did, we would be justified in asserting that Firm B is twice as “innovative” as Firm A. Notice that the same result holds, regardless of whether we look at innovation directly (by evaluating the number of new drugs brought to market) or indirectly (by examining a firm’s R&D expenditures which make innovation possible).

Although R&D expenditures serve as a good proxy for innovation, relying on gross R&D spending to measure innovation tends to overvalue large companies and undervalue small companies. For example, a ten person firm that miraculously develops a successful new drug every year is rightly considered to be more “innovative” than a multinational pharmaceutical giant that puts out two new drugs over the same period of time. To correct this imbalance, I use R&D spending as a percentage of total sales/revenues, as opposed to gross R&D spending, as a proxy for innovation.\footnote{I gathered data on the firms’ R&D expenditures and revenue/sales using the SEC’s EDGAR database of public company filings, http://www.sec.gov/edgar.shtml.}

As a background concern, some might argue that comparing a firm’s patenting activity and R&D spending in 1995 versus 2009 is like comparing apples to oranges. So much has changed in the global economy over the last fifteen years. How can any comparison between 1995 data and 2009 data be meaningful? Two aspects of my methodology should serve to at least partially alleviate this concern. First, the three companies I studied all
obtained a significant number of U.S. patents in both 1995 and 2009. This suggests that, although the economic climate may have changed, the firms in the study still believe that patents are an important part of their respective businesses, just as they did in 1995. Second, by dividing R&D expenditures by total sales/revenues, my proxy for innovation implicitly accounts for the firms’ changed economic fortunes between 1995 and 2009. It is not the firms’ total R&D spending that matters in my measure of innovation, but rather the percentage of total sales/revenues spent on R&D. My innovation metric would recognize even a relatively small amount of R&D spending as “innovative” in a down year (as measured by low total sales/revenues).

C. Isn’t There an Easier Way?

It is probably obvious from the preceding discussion that the data gathering and analysis required by my methodology is rather complex and time consuming. Is it really necessary to calculate the “global patent term” to show that a strong global patent regime supported by the PCT and the TRIPS Agreement results in a large “reward per invention”? The answer is straightforward. Less complicated methods exist, but they have serious flaws.

One simple option would be to compare the patent laws, particularly the patent terms, of all countries worldwide over a period of time. For example, a comparison of the patent laws in effect prior to the TRIPS Agreement and those enacted or amended after TRIPS would likely show that a large number of countries increased patent protection, including the patent term, in order to comply with TRIPS. As mentioned supra, many developing countries had patent terms of fifteen years or less before TRIPS
mandated a minimum patent term of twenty years.\textsuperscript{57} Based on this information alone, one might be tempted to conclude that inventors are reaping more rewards than ever before in the post-TRIPS world of strong global patent standards. This would be a mistake.

The fact that patent globalization, i.e., increasing the territory available for patent protection as well as the strength of that protection, has theoretically led to a larger market does not necessarily mean that the new or newly enhanced patent markets are accessible \textit{in practice}. For example, various cultural, governmental, and/or economic barriers to entry might preclude firms from actually taking advantage of the new markets. If firms cannot or do not seek and obtain patents in the new markets, it is logical to assume that the new markets do not provide much, if any, additional incentive for those firms to innovate. In this case, shortening the patent term in the U.S. to compensate for increased globalization might actually harm innovation. The GPT method overcomes this significant analytical problem by examining how firms actually behave when faced with the prospect of potential new markets, i.e., whether firms, in fact, are taking advantage of the global patent marketplace.

Another possibility would be to compare the raw number of patent applications filed in various countries over a period of time. If the number of patent application filings has increased over time in a large number of countries, one might assume that firms are, in practice, exploiting the global patent marketplace to achieve a high “reward per invention.” But there is a subtle flaw in this reasoning. Raw data on patent application filings by country reveals \textit{where} firms are seeking patent protection, but not whether

firms are pursuing *multiple patents on the same invention* in different countries. Stated differently, a large number of patent application filings might suggest that (1) relatively few inventions are being patented all over the globe, i.e., a high “reward per invention,” or (2) many different inventions are each being patented in a small number of countries, i.e., a low “reward per invention.” If a firm seeks a patent on a particular invention only outside of the United States, it follows that the U.S. patent term is irrelevant when it comes to innovation incentives for that particular invention. The incentive to create that specific invention was driven by the prospect of non-U.S. patents, or some non-patent rationale, rather than the U.S. patent term. As such, raw data on patent application filings around the globe has limited value when grappling with the policy question of whether and to what extent to adjust the patent term in the United States. The GPT delves deeper into the data, shedding light not only on where firms are patenting, but also to what extent firms are pursuing patent protection on a single invention in multiple countries. Thus, the GPT methodology has substantial advantages over other methods that could be used to evaluate the global patent landscape.

V. THREE CASE STUDIES: PFIZER, INTERNATIONAL PAPER, AND UNISYS

In order to evaluate the change in the global patent landscape over the last fifteen years, I analyzed the patenting activity, “global patent term,” and R&D expenditures of three very different firms: Pfizer, International Paper Company, and UNISYS. For each firm, I compared data from 1995 (when TRIPS was initially implemented) and 2009 (the most recent year in which a full patent data set was available).
I chose the three companies for a variety of reasons, some practical and some not so. First, all three firms sought and obtained U.S. patents in significant numbers in both 1995 and 2009. This was a prerequisite for gathering a workable set of data to analyze. Second, all three firms were, and still are, publicly traded, so their year-to-year financial results are readily accessible. Third, each firm participates in a very different industry—Pfizer in pharmaceuticals, International Paper in consumer products, and UNISYS in information technology. By analyzing firms from different technology sectors, I hoped to gain insight into how global patenting in different industries has changed over time. Did firms in vastly divergent industries respond similarly or differently to the changing international patent landscape?

I had additional reasons for selecting Pfizer and International Paper Company. In a nutshell, Pfizer was a driving force behind the TRIPS Agreement, pushing for strong mandatory intellectual property standards around the world.58 If any firm would be expected to take advantage of the new worldwide patenting potential ushered in by TRIPS and the proliferation of PCT contracting states, it is Pfizer. My reason for choosing International Paper Company was more personal. My father has been a research scientist at International Paper for many years, and in the recent economic downturn, he saw many of his friends and colleagues lose their jobs. I was interested to learn how a struggling company like International Paper dealt with the enhanced possibilities to obtain patent protection for its inventions outside the United States.

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A. Pfizer and its Changed Patenting Strategy

Pfizer made a sea change in its patenting strategy between the years of 1995 and 2009. In comparison to 1995, the firm now seeks patent protection for its inventions in more countries and reaps higher “rewards per invention” as measured by the “global patent term” metric. The results are summarized in Table 1 below.

<table>
<thead>
<tr>
<th>TABLE 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pfizer: A Comparison of Worldwide Patent Protection in 1995 and 2009*</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Total U.S. Patents Issued</td>
</tr>
<tr>
<td>Global Patent Term (years)**</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Global Patent Term, Excluding U.S. Patents (years)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Global Patent Term, Excluding U.S., EP, and WO Filings (years)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Total Number of Countries / Authorities Where Applications Were Filed***</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

*Pfizer’s U.S. patent data was obtained by searching the USPTO’s patent database, http://patft.uspto.gov/netahtml/PTO/search-bool.html. Corresponding worldwide patent family information was gathered using espacenet’s database, http://ep.espacenet.com/numberSearch?locale=en_EP.

**The “Global Patent Term” is the sum of the terms of protection of all the patents and published applications, worldwide, on a single invention, i.e., a single worldwide patent family. Each patent term in the calculation is scaled according to the gross domestic product (GDP) of the corresponding country, using the United States GDP as a baseline. For example, if country X has a patent term of 20 years, but its GDP is only 1/10 of the GDP of...
the United States, the scaled patent term for country X is \((1/10) \times 20\) years, or 2 years.

*** “Authorities” include the European Patent Office (EPO), the World Intellectual Property Office (WIPO), and other similar organizations that receive patent application filings.

The number of U.S. patents issued to Pfizer remained relatively stable, rising slightly from 77 in 1995 to 94 in 2009. However, Pfizer’s average GPT (mean/median), a measure of “reward per invention,” increased significantly from 95.7/85.4 years in 1995 to 131.4/108.7 years in 2009. It is worth pausing for a second to consider these numbers. First, note the magnitude of the increase. Pfizer’s mean GPT increased by 37% from 1995 to 2009, and its median GPT increased by 27% over the same period of time. In other words, Pfizer is obtaining a substantially higher “reward per invention” today than it did in 1995, before the TRIPS regime took hold.

Second, consider the size of the numbers involved here. The term of patent protection in the United States is 20 years. Therefore, if Pfizer sought patent protection for each of its inventions in the United States alone, its average GPT would be 20 years. Pfizer’s actual GPT is many, many times that. This indicates that Pfizer is obtaining multiple U.S. patents on the same or similar inventions and/or patenting its inventions in many countries around the world. In truth, it is a bit of both. Removing U.S. patents from the GPT calculation, Pfizer’s average GPT (mean/median) rose from 57.0/59.0 years in 1995 to 79.9/66.9 years in 2009. This indicates that Pfizer’s reward for patenting outside the United States is substantial and has significantly increased over the last fifteen years. Even excluding U.S., EP, and WO patent application filings, which heavily influence the GPT results, Pfizer’s average GPT (mean/median) is
considerable: 29.9/25.7 years in 2009, up from 23.7/22.6 years in 1995. No matter how the data is sliced, it is abundantly clear that Pfizer is reaping more “rewards per invention” today than it was in 1995, due in large part to its increased patenting activity around the globe.

Not only is Pfizer seeking patent protection in more countries (on average, 16 countries in 2009 versus 13 countries in 1995), but the firm has drastically changed course regarding where it files its patent applications. These results are presented in Table 2 below.

<table>
<thead>
<tr>
<th>Country / Authority</th>
<th>1995</th>
<th>2009</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>14%</td>
<td>72%</td>
<td>+58%</td>
</tr>
<tr>
<td>Argentina</td>
<td>0%</td>
<td>53%</td>
<td>+53%</td>
</tr>
<tr>
<td>Mexico</td>
<td>18%</td>
<td>69%</td>
<td>+51%</td>
</tr>
<tr>
<td>Eurasian Patent Office</td>
<td>0%</td>
<td>46%</td>
<td>+46%</td>
</tr>
<tr>
<td>China</td>
<td>26%</td>
<td>70%</td>
<td>+44%</td>
</tr>
<tr>
<td>Ecuador</td>
<td>1%</td>
<td>33%</td>
<td>+32%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>3%</td>
<td>30%</td>
<td>+27%</td>
</tr>
<tr>
<td>WIPO</td>
<td>71%</td>
<td>97%</td>
<td>+26%</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>32%</td>
<td>51%</td>
<td>+19%</td>
</tr>
<tr>
<td>Canada</td>
<td>79%</td>
<td>97%</td>
<td>+18%</td>
</tr>
<tr>
<td>European Patent Office</td>
<td>82%</td>
<td>97%</td>
<td>+15%</td>
</tr>
<tr>
<td>South Africa</td>
<td>42%</td>
<td>52%</td>
<td>+10%</td>
</tr>
<tr>
<td>OAPI</td>
<td>3%</td>
<td>13%</td>
<td>+10%</td>
</tr>
<tr>
<td>ARIPO</td>
<td>3%</td>
<td>10%</td>
<td>+7%</td>
</tr>
<tr>
<td>Japan</td>
<td>82%</td>
<td>88%</td>
<td>+6%</td>
</tr>
<tr>
<td>Russia</td>
<td>13%</td>
<td>12%</td>
<td>-1%</td>
</tr>
<tr>
<td>New Zealand</td>
<td>38%</td>
<td>29%</td>
<td>-9%</td>
</tr>
<tr>
<td>Spain</td>
<td>61%</td>
<td>23%</td>
<td>-38%</td>
</tr>
<tr>
<td>Greece</td>
<td>44%</td>
<td>0%</td>
<td>-44%</td>
</tr>
<tr>
<td>Denmark</td>
<td>62%</td>
<td>17%</td>
<td>-45%</td>
</tr>
</tbody>
</table>
This data reveals several interesting facets of Pfizer’s patent policy. First, Pfizer has moved towards patenting in Central and South America, e.g., in Brazil, Argentina, Mexico, and Ecuador, and away from patenting in many Western European countries such as Spain, Greece, Denmark, Austria, Germany, Portugal, Ireland, and Finland. This move is quite striking. For example, in 1995, only 14% of Pfizer’s U.S. patents had a patent family member in Brazil. By 2009, that number had risen to 72%. By contrast, 66% of Pfizer’s 1995 U.S. patents had a counterpart in Germany, and that number fell to a mere 13% in 2009.

It is easy to understand why Pfizer has increased its patenting activity in Central and South America: the company views these areas as new (or growing) markets for its products and is seeking protection accordingly. Pfizer’s decreased patenting activity in various European countries is more difficult to explain. One possibility is that Pfizer plans to file patent applications in these European countries, but either has not done so yet, or has done so but the patents have not been published or granted.

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59 Pfizer’s increased patent filings in countries such as Brazil and Argentina was likely precipitated by the TRIPS Agreement, which forbade *per se* bans on pharmaceutical product patents. Before TRIPS, many countries did not allow pharmaceutical product patents. See F.M. Scherer & Jayashree Watal, *Post-TRIPS Options for Access to Patented Medicines in Developing Nations*, J. INT’L ECON. L., vol. 5, no. 4, 2002, at 913, 914 (noting that Brazil, Argentina, and India did not permit pharmaceutical product patents before 1995).
yet. In other words, the 2009 data may be, to some extent, “incomplete.” A more likely explanation is that Pfizer now relies more heavily on European-wide patents (“EP patents”) instead of patenting in individual European countries. According to the European Patent Office (EPO), “[t]he European patent grant procedure and the national patent grant procedures exist in parallel. When seeking patent protection in one or more EPC contracting states, you [the inventor] therefore have a choice between following the national procedure in each state for which you want protection and taking the European route, which in a single procedure confers protection in all the contracting states that you designate.”\footnote{See European Patent Office Frequently Asked Questions, “Choosing a route: national, European or international?” http://www.epo.org/metanav/help/faq.html#11 (last visited Apr. 11, 2010).} In other words, a single EP patent can cover over thirty European countries.\footnote{As of 2010, there are thirty-six members of the European Patent Organization (EPO). \textit{See} Member states of the European Patent Organisation, http://www.epo.org/about-us/epo/member-states.html (listing all thirty-six EPO contracting states and the date each state became a member) (last visited Apr. 11, 2010).} In 2009, almost all of Pfizer’s U.S. patents (97%) had EP counterparts. By contrast, in 1995, “only” 82% of Pfizer’s U.S. patents had EP counterparts. This supports the conclusion that Pfizer has moved away from patenting in individual European countries in favor of seeking European-wide patent protection through the EPO.

Pfizer is also increasing its patent footprint in some Asian countries. The firm’s patent application filings in China rose from 26% in 1995 to 70% in 2009. Similarly, in 1995, Pfizer sought patent protection for 32% of its inventions in the Republic of Korea, while in 2009, that number was 51%.

Additionally, almost all (97%) of Pfizer’s 2009 U.S. patents had a related PCT application. The number of Pfizer’s U.S. patents with a related
PCT application in 1995 was high (71%), but not nearly as high as it is today. This suggests that Pfizer now relies even more heavily on the PCT international application filing process when seeking patent protection in multiple countries.

Finally, Pfizer is filing for patent protection in Africa at a higher rate today than it was in 1995, but the firm’s patent profile in Africa is still relatively small. In South Africa, Pfizer filed 42% of the time in 1995 and 52% of the time in 2009. Only 3% of Pfizer’s 1995 U.S. patents had related patent applications filed in the African Intellectual Property Organization (OAPI) and the African Regional Intellectual Property Organization (ARIPO). In 2009, 13% of Pfizer’s U.S. patents had OAPI counterparts and 10% had ARIPO counterparts.

By increasing its patenting activity around the globe, particularly in South America, Central America, some parts of Asia, and to a lesser extent Africa, Pfizer is receiving a greater “reward per invention” today than it did in 1995. If the patent system is working properly, we should see a corresponding increase in Pfizer’s “innovation” level. Do we? The results are mixed.

As shown in Table 3 below, Pfizer has steadily and substantially increased its R&D expenditures from the early 1990s until today.\(^\text{62}\)

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However, as a percentage of total revenue, Pfizer’s R&D spending has remained relatively flat (see Table 4 below).
Thus, Pfizer presents the perfect case for reducing the patent term in the United States. Its “reward per invention,” as measured by GPT, is significantly higher today than it was in 1995, but its level of innovation, as measured by R&D spending as a percentage of revenue, is essentially the same. In other words, the additional patent protection Pfizer is obtaining around the globe is not spurring additional innovation. Pfizer was just as “innovative” in 1995, before TRIPS and the PCT took hold and fortified the worldwide IP regime. Therefore, one would expect that reducing the patent term in the United States might harm Pfizer’s profitability, but not its level of innovation. For firms in Pfizer’s position, heightened foreign patent protection would essentially offset any marginal loss of incentive to innovate resulting from a shorter U.S. patent term. So why shouldn’t Congress reduce the term of patent protection in the United States? Because not every firm is Pfizer.

B. International Paper and its (Slightly) Changed Patenting Strategy

International Paper’s response to the post-TRIPS patent landscape was much more subtle than Pfizer’s. The average “global patent term” of International Paper’s patents was higher in 2009 than it was in 1995, but the increase was relatively small, especially when U.S., EP, and WO filings were excluded from the GPT calculation. Additionally, both in 1995 and 2009, International Paper typically pursued patents on its inventions only in the United States. In other words, the theoretical availability of strong patents in many different countries has not made much practical difference to International Paper’s worldwide patenting strategy. The results are summarized in Table 5 below.
**TABLE 5**


<table>
<thead>
<tr>
<th></th>
<th>1995</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total U.S. Patents Issued</td>
<td>35</td>
<td>37</td>
</tr>
<tr>
<td>Global Patent Term (years)**</td>
<td>Mean: 42.9</td>
<td>Mean: 66.1</td>
</tr>
<tr>
<td></td>
<td>Median: 20.0</td>
<td>Median: 40.0</td>
</tr>
<tr>
<td>Global Patent Term,</td>
<td>Mean: 16.0</td>
<td>Mean: 26.7</td>
</tr>
<tr>
<td>Excluding U.S. Patents (years)</td>
<td>Median: 0.0</td>
<td>Median: 0.0</td>
</tr>
<tr>
<td>Global Patent Term,</td>
<td>Mean: 4.0</td>
<td>Mean: 5.6</td>
</tr>
<tr>
<td>Excluding U.S., EP, and</td>
<td>Median: 0.0</td>
<td>Median: 0.0</td>
</tr>
<tr>
<td>WO Filings (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Number of Countries /</td>
<td>Mean: 3.2</td>
<td>Mean: 3.4</td>
</tr>
<tr>
<td>Authorities Where</td>
<td>Median: 1.0</td>
<td>Median: 1.0</td>
</tr>
<tr>
<td>Applications Were Filed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


**The “Global Patent Term” is the sum of the terms of protection of all the patents and published applications, worldwide, on a single invention, i.e., a single worldwide patent family. Each patent term in the calculation is scaled according to the gross domestic product (GDP) of the corresponding country, using the United States GDP as a baseline. For example, if country X has a patent term of 20 years, but its GDP is only 1/10 of the GDP of the United States, the scaled patent term for country X is [(1/10) x 20 years], or 2 years.

*** “Authorities” include the European Patent Office (EPO), the World Intellectual Property Office (WIPO), and other similar organizations that receive patent application filings.

International Paper received roughly the same number of U.S. patents in 1995 (35) and 2009 (37). While its average GPT (mean/median) increased from 42.9/20.0 years in 1995 to 66.1/40.0 years in 2009, most of
that increase was due to multiple related U.S. patents on the same or similar inventions. When U.S. patents are eliminated from the GPT calculation, the median GPT for International Paper’s patents in both 1995 and 2009 was 0.

In other words, when International Paper filed for patent protection in the United States, it did not seek a patent anywhere else in the world a majority of the time. Going a step further, by excluding the U.S., EP, and WO patent application filings from the GPT calculation, it becomes even more obvious that International Paper has not exploited the worldwide patent market to nearly the same extent as Pfizer has: International Paper’s average (mean/median) GPT was a paltry 4.0/0.0 years in 1995 and 5.6/0.0 years in 2009. On average (mean/median), International Paper only sought patent protection in 3.2/1.0 countries in 1995 and 3.4/1.0 countries in 2009. This lends further support to the proposition that International Paper does not generally seek patents outside of the United States and has not benefited appreciably from the heightened intellectual property standards in non-U.S. countries.

Although most of International Paper’s U.S. patents have no foreign patent application counterparts, the firm has altered course regarding where it seeks patent protection when it does decide to file outside the United States. Specifically, the firm has increased its patent profile in China, and to a lesser extent in South America, while declining to file patent applications as often in Germany, Australia, and Japan. The data is presented in Table 6 below.
It is interesting to compare International Paper’s changed patenting strategy with Pfizer’s. Both firms appear to seek patent protection in South America (Brazil and Argentina) and Central America (Mexico) more often today than they did in 1995. Additionally, both International Paper and Pfizer used the PCT international application filing process more frequently in 2009 than in 1995. There are some differences as well. For example, International Paper moved away from patenting in Japan in 2009 while Pfizer continued to apply for patents in Japan at a very high rate.

Because International Paper’s “reward per invention,” as measured by GPT, was similar in 1995 and 2009, we should not expect to see any appreciable increase in International Paper’s level of innovation, as measured by R&D expenditures. In reality, International Paper has sharply

<table>
<thead>
<tr>
<th>Country / Authority</th>
<th>1995</th>
<th>2009</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>0%</td>
<td>30%</td>
<td>+30%</td>
</tr>
<tr>
<td>WIPO</td>
<td>34%</td>
<td>49%</td>
<td>+15%</td>
</tr>
<tr>
<td>Russia</td>
<td>0%</td>
<td>14%</td>
<td>+14%</td>
</tr>
<tr>
<td>Brazil</td>
<td>3%</td>
<td>14%</td>
<td>+11%</td>
</tr>
<tr>
<td>Argentina</td>
<td>0%</td>
<td>8%</td>
<td>+8%</td>
</tr>
<tr>
<td>Mexico</td>
<td>6%</td>
<td>14%</td>
<td>+8%</td>
</tr>
<tr>
<td>Canada</td>
<td>20%</td>
<td>27%</td>
<td>+7%</td>
</tr>
<tr>
<td>European Patent Office</td>
<td>26%</td>
<td>30%</td>
<td>+4%</td>
</tr>
<tr>
<td>South Africa</td>
<td>6%</td>
<td>3%</td>
<td>-3%</td>
</tr>
<tr>
<td>Spain</td>
<td>11%</td>
<td>5%</td>
<td>-6%</td>
</tr>
<tr>
<td>Austria</td>
<td>20%</td>
<td>11%</td>
<td>-9%</td>
</tr>
<tr>
<td>Germany</td>
<td>17%</td>
<td>3%</td>
<td>-14%</td>
</tr>
<tr>
<td>Australia</td>
<td>26%</td>
<td>11%</td>
<td>-15%</td>
</tr>
<tr>
<td>Japan</td>
<td>23%</td>
<td>3%</td>
<td>-20%</td>
</tr>
</tbody>
</table>

*This table shows the percentage of International Paper’s 1995 and 2009 U.S. patents, respectively, that have related foreign applications in a given country / authority.
cut back its R&D expenditures between 1995 and the present day (see Tables 7 and 8 below).
For whatever reason, International Paper has determined that it cannot, or should not, seek patents on its inventions outside of the United States with any regularity. For firms like International Paper, the prospect of stronger patent laws (as mandated by TRIPS) and easier access to patents (through the PCT international application procedure) in countries around the world makes little difference. If the promise of patent protection encourages these firms to innovate, it is only U.S. patents that count. Shortening the patent term in the United States may reduce, or even eliminate, International Paper’s incentive to innovate, thereby driving its R&D spending even lower than it is today.

C. UNISYS and its (Un)changed Patenting Strategy

Even more so than International Paper Company, UNISYS is a quintessential example of a firm that, for all intents and purposes, plays the patent game only in the United States. Even though UNISYS obtained a considerable number of U.S. patents in both 1995 and 2009, almost none of those patents had related patent applications in any foreign country. The UNISYS data is presented in Table 9 below.
TABLE 9


<table>
<thead>
<tr>
<th></th>
<th>1995</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total U.S. Patents Issued</td>
<td>112</td>
<td>52</td>
</tr>
<tr>
<td><strong>Global Patent Term (years)</strong></td>
<td>Mean: 54.1</td>
<td>Mean: 42.0</td>
</tr>
<tr>
<td></td>
<td>Median: 20.0</td>
<td>Median: 20.0</td>
</tr>
<tr>
<td><strong>Global Patent Term, Excluding U.S. Patents (years)</strong></td>
<td>Mean: 8.4</td>
<td>Mean: 11.2</td>
</tr>
<tr>
<td></td>
<td>Median: 0.0</td>
<td>Median: 0.0</td>
</tr>
<tr>
<td><strong>Global Patent Term, Excluding U.S., EP, and WO Filings (years)</strong></td>
<td>Mean: 1.8</td>
<td>Mean: 2.8</td>
</tr>
<tr>
<td></td>
<td>Median: 0.0</td>
<td>Median: 0.0</td>
</tr>
<tr>
<td>Total Number of Countries / Authorities Where Applications Were Filed***</td>
<td>Mean: 1.6</td>
<td>Mean: 1.5</td>
</tr>
<tr>
<td></td>
<td>Median: 1.0</td>
<td>Median: 1.0</td>
</tr>
</tbody>
</table>


**The “Global Patent Term” is the sum of the terms of protection of all the patents and published applications, worldwide, on a single invention, i.e., a single worldwide patent family. Each patent term in the calculation is scaled according to the gross domestic product (GDP) of the corresponding country, using the United States GDP as a baseline. For example, if country X has a patent term of 20 years, but its GDP is only 1/10 of the GDP of the United States, the scaled patent term for country X is [(1/10) x 20 years], or 2 years.

*** “Authorities” include the European Patent Office (EPO), the World Intellectual Property Office (WIPO), and other similar organizations that receive patent application filings.

The results are fairly straightforward. UNISYS’ average GPT is low, especially when U.S. patents are excluded from the calculation, and is approximately the same in 1995 and 2009. The average (mean/median)
number of countries in which UNISYS sought patent protection was 1.6/1.0 in 1995 and 1.5/1.0 in 2009, confirming that UNISYS patents its inventions almost exclusively in the United States. Unlike Pfizer and International Paper, UNISYS’ patenting strategy was the same in 1995 and 2009 – file in the United States and don’t bother filing elsewhere (see Table 10 below).

### TABLE 10

<table>
<thead>
<tr>
<th>Country / Authority</th>
<th>1995</th>
<th>2009</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>1%</td>
<td>4%</td>
<td>+3%</td>
</tr>
<tr>
<td>Canada</td>
<td>4%</td>
<td>6%</td>
<td>+2%</td>
</tr>
<tr>
<td>Brazil</td>
<td>0%</td>
<td>2%</td>
<td>+2%</td>
</tr>
<tr>
<td>Japan</td>
<td>10%</td>
<td>10%</td>
<td>0%</td>
</tr>
<tr>
<td>Australia</td>
<td>4%</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Mexico</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Argentina</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>France</td>
<td>2%</td>
<td>0%</td>
<td>-2%</td>
</tr>
<tr>
<td>European Patent Office</td>
<td>13%</td>
<td>10%</td>
<td>-3%</td>
</tr>
<tr>
<td>Germany</td>
<td>8%</td>
<td>4%</td>
<td>-4%</td>
</tr>
<tr>
<td>WIPO</td>
<td>15%</td>
<td>10%</td>
<td>-5%</td>
</tr>
</tbody>
</table>

*This table shows the percentage of UNISYS’ 1995 and 2009 U.S. patents, respectively, that have related foreign applications in a given country / authority.

Turning to the question of UNISYS’ level of innovation, one would expect it to be relatively stable since the average GPT for UNISYS’ 1995 U.S. patents and its 2009 patents is similar. Any substantial increase in innovation would be unexpected. In actuality, UNISYS’ R&D expenditures have gradually declined from the mid-1990s until today (see Tables 11 and 12 below).
Just as Pfizer is a model example of why the patent term in the United States should be reduced, UNISYS is a model example of why it should not be reduced. The present era of strong global patent laws and easy access to patents in many countries benefits firms like Pfizer that reap monopoly rewards by obtaining both U.S. and non-U.S. patents on the same invention. Pfizer’s incentives to innovate come from the promise of monopoly profits both in the U.S. and abroad, so higher levels of foreign patent protection would counterbalance any innovation incentive that would be lost by reducing the patent term in the United States. On the other hand, UNISYS relies almost solely on the U.S. patent system to protect its inventions. Strong patent laws in countries other than the United States make no difference to UNISYS because it does not play in the global patent field. Therefore, reducing the patent life in the United States might significantly dampen UNISYS’ incentive to innovate.

At this point, it is worthwhile to lay open the limits of my claim. I am not claiming that the three firms I studied are representative of all firms in all industries, or even all firms in particular industries. That is almost certainly not the case. What I am claiming is that different firms in different industries have responded to the prospect of patent globalization in vastly dissimilar ways. Policymakers should consider, not ignore, these disparities when charting the future course of U.S. patent law.
VI. CONCLUSION & RECOMMENDATIONS:
TECHNOLOGY-SPECIFIC PATENT TERMS


Some have suggested that increased globalization should result in decreased patent terms. Professor Eric Johnson clearly states the argument as follows. It is difficult, if not impossible, to calculate optimal patent durations in the real world based on currently available economic data. However, there are several “levers” that might be used to tweak the patent system in hopes of increasing performance. These “levers” include duration (patent term), breadth (patent scope), and level of enforcement. Of the three “levers,” adjusting the patent term is a particularly appealing solution because it is simple and can be fine-tuned as necessary.

63 See Eric E. Johnson, Calibrating Patent Lifetimes, 22 SANTA CLARA COMPUTER & HIGH TECH. L.J. 269, abstract (2006). Several scholars have used economic analysis in an attempt to discover the optimum patent term, but their results are general and somewhat contradictory. See Richard Gilbert & Carl Shapiro, Optimal Patent Length and Breadth, RAND J. ECON., Vol. 21, No. 1, Spring 1990, at 106-112 (suggesting that the optimum patent has infinite duration and narrow scope); Andrew W. Horowitz & Edwin L.-C. Lai, Patent Length and the Rate of Innovation, INT’L ECON. REV., Vol. 37, No. 4, Nov. 1996, at 785-801 (finding that the patent length which maximizes innovation is longer than that which maximizes consumer welfare and proposing an intermediate patent duration to balance these forces); Ted O’Donoghue et al., Patent Breadth, Patent Life, and the Pace of Technological Progress, J. ECON. & MGMT. STRATEGY, Vol. 7, No. 1, 1998, at abstract (arguing that broad patents of finite length improve the diffusion of new products, while narrow patents with a long life result in lower R&D costs).


65 See id.

66 See id. at 285-89.
globalization of patents has resulted in a larger market that firms and inventors can exploit – “a greater financial reward is available to the monopoly-rights [patent] holder.”\textsuperscript{67} In order to offset this increased reward, the patent term should be decreased, or so the argument goes.\textsuperscript{68} One proposed method for determining the proper patent term adjustment is to “calculate the size of the increase in the market – probably through a measure such as gross domestic product – and then make an adjustment upwards in protection to offset the costs associated with launching a product in a new country.”\textsuperscript{69}

Notwithstanding this line of reasoning, the results of my research discussed supra compel me to conclude that an across the board patent term reduction in the United States is not warranted, despite the previous, and still ongoing, globalization of intellectual property. There are three fundamental flaws in the argument that patent globalization, in and of itself, is enough to make reducing patent lifetimes in the United States a good idea.

First, the fact that globalization has \textit{theoretically} led to a larger market does not necessarily imply that the new markets are accessible \textit{in practice}. Cultural, legal, economic, and governmental barriers to entry might discourage firms from participating in the patent game in many countries with new, or newly strengthened, patent systems. If a significant number of firms are not pursuing patents in the new markets, for whatever reason, it is logical to assume that the new markets do not provide these firms with any additional incentive to innovate. My empirical research

\textsuperscript{67} Id. at 293.
\textsuperscript{68} See id. at 294.
\textsuperscript{69} Id. at 295.
supports this proposition. Despite the relative ease of filing an international patent application using the PCT process, the proliferation of PCT contracting states, and stronger patent laws ushered in by the TRIPS Agreement, two out of the three companies I studied (International Paper and UNISYS) still choose to patent, on average, only in a small number of countries. As such, UNISYS’ and International Paper’s average “reward per invention,” as measured by GPT, was much the same in 2009 as it was in 1995. Shortening the patent term in countries in which these firms do seek patents, such as the United States, is not offset by the thought of patent protection in countries in which the firms do not seek patents. Thus, reducing the patent term in the United States would likely have an undesirable effect on innovation.

Second, an across the board patent term reduction in the United States would directly affect firms in every industry, while the globalization of IP has a significant direct impact only on particular industries, e.g., industries comprising firms that seek patents in many different countries. My research supports this position as well. On average, Pfizer pursues patents in more countries today than it did in 1995. As a result, the firm’s “reward per invention,” as measured by GPT, was notably higher in 2009 than it was fifteen years ago. The pharmaceutical industry, it seems, has benefited from the globalization of IP. A reduction in U.S. patent term should not dampen the incentive to create new drugs, and even if it does, the promise of more patent exclusivity in the rest of the world should mitigate the problem. On the other hand, UNISYS patents its invention almost solely in the United States. That was true in 1995, and it remained true in 2009. Therefore, UNISYS’ “reward per invention” is heavily dependent on the U.S. patent term. Shortening the lifetime of U.S. patents, even by a
small amount, might lessen UNISYS’ incentive to innovate in a way that cannot be offset by increased patent globalization. The fact that patent globalization discriminates among technologies is unsurprising. Some products, such as pharmaceuticals, are in demand in developing as well as developed countries. Others, such as information technology services, are only marketable in countries that have built a significant technological infrastructure. This excludes many developing countries from the profitability equation.

Third, if patent globalization has spurred innovation, above and beyond that seen prior to globalization, then there is less reason to believe that we should decrease the patent term in the United States, lest we harm innovation. In other words, if we see increased innovation, as measured by higher R&D spending, post-globalization, we might assume that the pre-globalization incentives to innovate, including the U.S. patent term, were not high enough to support maximum innovation. Accepting this argument, globalization is essentially correcting a previously inadequate incentive structure by increasing innovation incentives to an efficient level. One can certainly imagine how globalization would spur innovation. For example, developing countries might need different products and services than developed nations do, enticing multinational firms to step in and take advantage of these new markets by creating new products and providing new services. At least one scholar argues that TRIPS has stimulated innovation.  

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B. Technology-Specific Patent Terms as a Potential Solution

Patent globalization discriminates. It benefits firms that have something valuable to sell to the developing countries that have been swept into the global patent regime (see Pfizer). For firms selling goods developing countries do not need, at least not yet, the post-globalization marketplace looks pretty much the same as the pre-globalization marketplace (see UNISYS). Additionally, the effects of patent globalization can be subtle and complex. Firms move in to exploit new markets in some countries, as expected, but unexpectedly move out of the patent game in other countries where patents are still readily available. For example, between 1995 and 2009, it appears that Pfizer increased its patenting activity in Central and South America but reduced its patenting activity in many Western European countries. Similarly, International Paper Company sought patents in China and South America with more frequency in 2009 than in 1995, while at the same time filing less frequently in Germany, Japan, and Australia.

Patent globalization’s complicated and variable effect on different industries provides a strong rationale for moving away from a single patent term for all industries and towards technology-specific patent terms. As a “lever” to adjust innovation, the unitary patent term is simply too blunt an instrument. A short patent term might be ideal for industries that have reaped the rewards of patent globalization, such as the pharmaceutical industry. For other industries that rely heavily or solely on U.S. patents, a relatively long patent term in the United States might be necessary to provide optimal innovation incentives.
There are those who argue that shortening the patent term is unwarranted. Economist F.M. Scherer “likens the market for innovation to a sweepstakes, ‘the innovation lottery,’ that randomly bestows huge prizes on a very small number of winners.”\(^7\) In this hit-or-miss system, perhaps long patent terms are necessary so that the “hits” are sufficiently valuable make up for the “misses.” Additionally, there are non-trivial costs associated with selling in worldwide markets. If a firm hopes to market and sell its inventions in multiple countries, it will likely need regulatory approval in each country. Seeking this approval can be costly and time consuming. A firm’s potential liability also increases when the firm does business in many different countries. The Ciba Geigy / clioquinol tragedy is a prime example. In the 1960s, the drug clioquinol caused blindness in thousands of Japanese users.\(^7\) At the time, “clioquinol had been widely used in other countries for many years with no major ill effects. The peculiarity of the Japanese experience has never been adequately explained.”\(^7\) “By 1981, Ciba Geigy had paid out over $490 million to Japanese…victims.”\(^7\) Relatively long patent terms might be preferable in order to compensate firms for the increased regulatory and (potential) liability costs associated with participating in the worldwide marketplace.


\(^7\) Id.

Although these concerns are certainly valid, I believe they can be mitigated by adopting properly calibrated technology-specific patent terms. First, it is crucial to understand that I would only support a patent term reduction in industries that are actually taking advantage of the global patent marketplace. In theory, firms in these industries have performed a cost-benefit analysis and concluded that the benefits of patent protection, e.g., market exclusivity for a certain period of time, outweigh the costs, e.g., regulatory approval costs, increased liability exposure, etc., in each of the countries where a patent is sought. In other words, it is presumably profitable for firms in these industries to seek patent protection in many countries all over the world – otherwise, the aforementioned firms would simply forgo patenting altogether in these countries. Additionally, to the extent that a country’s low GDP is a proxy for high costs imposed on the patenting firms, e.g., due to high barriers to entry and regulatory costs, the “global patent term” metric accounts for these costs by using GDP to scale each country’s contribution to the overall GPT.

On a more fundamental level, it is conceivable that shortening the U.S. patent term in response to patent globalization may be detrimental to U.S. trade policy. The United States cares a great deal about global trade.\textsuperscript{75} If companies, or the industries in which they participate, are penalized for patenting abroad by having their U.S. patent terms cut, they might be discouraged from participating in international trade. Instead of patenting in foreign countries, one might worry that these firms will withdraw from, or

\textsuperscript{75} According to the Office of the United States Trade Representative (USTR), “American trade policy works toward opening markets throughout the world to create new opportunities and higher living standards for families, farmers, manufacturers, workers, consumers, and businesses.” See Mission of the USTR, http://www.ustr.gov/about-us/mission (last visited Apr. 21, 2010).
decline to enter, the global marketplace altogether. This fear may be overblown. First, firms would still have non-patent related incentives to participate in international trade. Second, the disincentive to patent abroad could be lessened by reducing the U.S. patent term only slightly, and only as a response to significant increases in “global patent term.” Stated differently, I am not proposing a one-to-one correlation between increase in GPT and decrease in U.S. patent term. A 30% increase in GPT might warrant only a 10% reduction in U.S. patent term, for example. This should alleviate any concerns about U.S. firms being fearful of patenting in foreign countries. Finally, cutting the length of patent protection in the U.S. might actually serve as a wake-up call to firms that are capable of entering the global marketplace but have not done so yet. Lowering patent protection in the United States would likely drive firms to seek profits elsewhere, thereby paving the way for industrial and technological transfer from the developed world to less-developed countries.

In addition to the just-recounted general concerns about shortening the patent term, technology-specific patent terms have problems in and of themselves. According to Ove Granstrand, “[c]ounterarguments to industry-specific schemes for IPRs [intellectual property rights] emphasize the resulting high transaction costs, including IP administration costs, and the fact that a certain amount of industry tailoring already exists in the laws and practices of patent offices and courts.”

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76 One such incentive is the “first mover” or “head start” advantage that a firm gets by being the first to enter a market. See generally Marvin B. Lieberman & David B. Montgomery, First-Mover Advantages, STRATEGIC MGMT. J., Vol. 9, Issue S1, Feb. 2007, at 41, 41-58.

argument, I believe a carefully crafted system of technology-specific patent terms, such as the one described immediately below, will be able to overcome these administrative hurdles.

The United States Patent and Trademark Office (USPTO) already classifies patent applications according to the nature of the inventions. For example, “apparel” can be found in Class 2, while “firearms” reside in Class 42. Additionally, the International Patent Classification (IPC) system provides a standardized framework for “the classification of patents and utility models according to the different areas of technology to which they pertain.” One could conduct a worldwide patent search using the IPC in order to determine which technologies are, in fact, being heavily patented around the globe and which technologies are not. Using the current twenty-year patent term as a baseline, one could develop technology-specific patent terms based on the level of global patenting in each technology sector: longer U.S. patent terms in industries that do not typically obtain patents outside of the United States, and shorter terms in industries in which firms routinely seek patent protection in many different countries. In order to keep pace with the rapidly evolving global marketplace and patent landscape, it would be wise to reevaluate the appropriate patent term for each technology sector relatively frequently, e.g., every ten years or so. Finally, clever patent attorneys will likely attempt to draft patent applications to fit in one of the “high patent term” technology categories. This gamesmanship


79 See id.

can be reduced by grouping inventions in relatively coarsely defined technology categories, e.g., “pharmaceuticals,” “automobiles,” “televisions,” etc., for patent term determinations. Even a skilled patent attorney will have difficulty “drafting around” broad categories such as these.

To be sure, I am not the first to propose technology-specific patent terms. In a 2006 article, professor Eric Johnson stated, “[t]he patent system could better achieve its primary mission of incentivizing technological innovation by moving away from the one-size-fits-all 20-year term for patents and moving to a system of varying durations for different categories of invention.”

Even more broadly, according to intellectual property scholars Graeme Dinwoodie and Rochelle Dreyfuss, “[i]n the last few years, it has become increasingly difficult to believe that a one-size-fits-all approach to patent law can survive” and “industry-specific patent laws are fully consistent with the comparative advantage philosophy that undergirds the modern trade regime.”

I add my voice to theirs, urging consideration of technology-specific patent terms as a “lever” to optimize innovation in not only one industry, but all industries. The globalization of intellectual property has discriminated among technologies, and our patent laws must respond accordingly.

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