

HARMONY AND DIVERSITY IN GLOBAL PATENT LAW

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ABSTRACT

The second half of the twentieth century saw the rise of a broad movement to harmonize patent laws across nation-states. The most recent, and most significant, manifestation of this movement is the 1994 TRIPS Agreement, which requires signatory nations to adopt uniform rules on many major issues of patent law. The TRIPS Agreement has now been implemented by well over one hundred countries, including almost all major industrial nations, and it heralds a new level of international uniformity in patent law.

This Article, while acknowledging the value of some harmonization of national law, explores the possible costs of the harmonization movement. Patent law itself owes its very birth not to harmony but to diversity of national law. The fifteenth-century Venetian patent statute was an experiment in law and a departure from the classical hostility to monopoly. Throughout the history of patent law, individual nations have varied their law and practice, and the results of these experiments have strengthened and improved patent practice. Diversity and experimentation continue today. As case studies of such experimentation, this Article examines business method patents and law governing the experimental use defense to patent infringement, an area in which both commentators and nations have split as to the proper approach for the law.

This Article concludes that the patent law of the twenty-first century would be enriched if national and international policymakers learn to value variety.

I. INTRODUCTION

Uniformity of law has an undeniable intellectual appeal. It simplifies the law, makes it easier to learn and describe, and reduces administrative costs. Yet uniformity has its costs too. It makes the law unresponsive to local variations, eliminates interjurisdictional competition and decreases the possibilities for legal experimentation. The choice between uniformity

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and diversity is difficult and has, not surprisingly, generated great debate in numerous areas of law and social policy, including such diverse matters as corporate law, international antitrust law, local and international taxation, tort law, securities regulation, and environmental law.¹ The literature in these areas frequently focuses on whether competing legal regimes will produce inefficient and socially destructive competition (“races to the bottom”) or wealth maximizing competition (“races to the top”). But jurisdictional competition is only one of a number of relevant considerations; the debate encompasses a more general and fundamental inquiry into the social efficiency of harmonized law.

Curiously, the implications of this debate have generally not been considered in the area of patent law. With few exceptions, the international patent community has taken as a given the value of creating uniform patent law on a global scale. For example, in remarks concerning the future of patent law, the former head of the U.S. Patent and Trademark Office, Q. Todd Dickinson, simply presumed a consensus on the need for a global patent system:

I think most of us here [at the annual Fordham Conference on International Intellectual Property Law and Policy] would say that there definitely should be a global patent system of some sort by

1. For some of the leading articles, see the following: In corporate law, see Lucian Arye Bebchuck, *Federalism and the Corporation: The Desirable Limits on State Competition in Corporate Law*, 105 HARV. L. REV. 1435 (1992); Roberta Romano, *The State Competition Debate in Corporate Law*, 8 CARDOZO L. REV. 709 (1987); Ralph K. Winter, Jr., *State Law, Shareholder Protection, and the Theory of the Corporation*, 6 J. LEGAL STUD. 251 (1977); William L. Cary, *Federalism and Corporate Law: Reflections upon Delaware*, 83 YALE L.J. 663 (1974). In environmental law, see Richard L. Revesz, *Federalism and Environmental Regulation: A Public Choice Analysis*, 115 HARV. L. REV. 553 (2001); Richard L. Revesz, *Rehabilitating Interstate Competition: Rethinking the “Race-to-the-Bottom” Rationale for Federal Environmental Regulation*, 67 N.Y.U. L. REV. 1210 (1992); Richard B. Stewart, *Pyramids of Sacrifice? Problems of Federalism in Mandating State Implementation of National Environmental Policy*, 86 YALE L.J. 1196 (1977). In tax law, see Julie Roin, *Competition and Evasion: Another Perspective on International Tax Competition*, 89 GEO. L.J. 543 (2001); Reuven S. Avi-Yonah, *Globalization, Tax Competition, and the Fiscal Crisis of the Welfare State*, 113 HARV. L. REV. 1573 (2000). In tort law, see Bruce L. Hay, *Conflicts of Law and State Competition in the Product Liability System*, 80 GEO. L.J. 617 (1992). In antitrust law, see generally Spencer Weber Waller, *An Internationalization of Antitrust Enforcement*, 77 B.U. L. REV. 343 (1997); Frank H. Easterbrook, *Antitrust and the Economics of Federalism*, 26 J.L. & ECON. 23 (1983). In the theory of federalism, see Barry Friedman, *Valuing Federalism*, 82 MINN. L. REV. 317 (1997); Michael W. McConnell, *Federalism: Evaluating the Founders’ Design*, 54 U. CHI. L. REV. 1484 (1987). For a general theory concerning local provision of public goods, see Charles M. Tiebout, *A Pure Theory of Local Expenditures*, 64 J. POL. ECON. 416 (1956).

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2010. I think we can all list probable benefits of such a system: reduced costs for inventors and for their assignees, dramatically simpler protection, and uniformity of that protection throughout the world.²

Mr. Dickinson's sense of his audience seems correct. The "profound public policy need for this global system" is a generally accepted postulate, and the task for policymakers is limited to sorting through the "diversity of the existing systems and the current proposals" and to "achieving a consensus on the nature of the global patent" system that should be created.³

This attitude has produced concrete changes. The second half of the twentieth century saw the rise of a broad movement to harmonize patent laws across nation-states. The most recent, and most significant, manifestation of this movement is the 1994 Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS), which requires signatory nations to conform their patent laws to a uniform framework of international standards.⁴ The TRIPS Agreement has now been implemented by well over

2. Hon. Q. Todd Dickinson, *The Long-Term International View of Patents and Trademarks*, in 4 INTERNATIONAL INTELLECTUAL PROPERTY LAW & POLICY 14-1 to 14-2 (Hugh C. Hansen, ed. 2000).

3. *Id.* at 14-2 to 14-3; see also *Computer Program Product/IBM*, T 1173/97-3.5.1, ¶ 2.6 (EPO Bd. of App. July 1, 1998), <http://www.european-patent-office.org/dg3/pdf/t971173ex1.pdf> (describing the "(world-wide) harmonisation of patent law" as "highly desirable"); Robert M. Sherwood, *Why a Uniform Intellectual Property System Makes Sense for the World*, in GLOBAL DIMENSIONS OF INTELLECTUAL PROPERTY RIGHT IN SCIENCE AND TECHNOLOGY 68, 68 (1993) (arguing that "a uniform intellectual property system makes sense for the world"); Marshall A. Leaffer, *Protecting United States Intellectual Property Abroad: Toward a New Multilateralism*, 76 IOWA L. REV. 273, 278 (1991) (stating a "general thesis" that "the ultimate goal of the United States . . . should be the adequate protection of intellectual property based on international standards," but acknowledging that some flexibility may be needed to accommodate "the countervailing interests of the developing nations whose exigent economic interests differ from those of the West"); Gerald J. Mossinghoff & Vivian S. Kuo, *World Patent System Circa 20XX, A.D.*, 38 IDEA 529, 530 (1998) (arguing that the current national patent search system has a debilitating and "unnecessary redundancy [that] drives up the costs of obtaining and enforcing worldwide patent protection to a level that can only be afforded by the largest multinational corporations [and] also adversely impacts the governments themselves"); Kate H. Murashige, *Harmonization of Patent Laws*, 16 HOUS. J. INT'L L. 591, 591-92 (1994) (beginning from the premise that "[h]armonization of patent systems would eliminate unnecessary complexity in patent law and benefit international trade and multinational ownership interests" and then investigating "the means to achieve harmonization"); Robert W. Pritchard, *The Future is Now—The Case for Patent Harmonization*, 20 N.C. J. INT'L L. & COM. REG. 291 (1995) (arguing that patent harmonization is in the best interests of the United States).

4. See Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, 33 I.L.M. 81 [hereinafter TRIPS Agreement].

100 countries, including almost all major industrial nations, and heralds a new level of international uniformity in patent law. In the post-TRIPS world, harmonization continues to be a shibboleth in patent circles, and diversity a flaw to be remedied.⁵

Further harmonization on a global scale would, of course, provide certain benefits. As Mr. Dickinson notes, it could reduce administrative costs and provide simplicity and uniformity in application. But it would also preclude interjurisdictional competition and experimentation in patent law, among other things. The relevant policy question is to what extent interjurisdictional diversity and competition should be sacrificed to achieve global uniformity. This question is important not only for determining the optimal amount of harmonization to be pursued in the future, but also for understanding the proper limitations of the steps already taken toward global harmonization of patent law, particularly the TRIPS agreement. If jurisdictional diversity retains some merit, then the provisions in TRIPS permitting variance should be interpreted much more broadly than if harmonization were an unqualified good.

To investigate the relative values of harmony and diversity, this Article draws on the rich literature concerning interjurisdictional legal diversity and competition that has developed in other areas. The law of patents can profit from this literature because it provides valuable insights into the forces driving patent harmonization and the potential costs of uniformity. Yet the benefits also flow in the other direction. Not only can patent law borrow from general theories of interjurisdictional diversity and competition, it can also enrich those theories.

Scholars studying interjurisdictional legal diversity tend to agree that such diversity has at least two potential values: First, it can help match the level of public goods to the tastes and resources of the local population. Second, under certain conditions, it can lead to interjurisdictional competition that checks inefficient government behavior. A third potential value of diversity—that it can breed desirable experimentation and innovation in law—has proven more controversial. On the one hand, legal scholars have acknowledged the possibility of legal experimentation and innovation.⁶ Indeed, this tradition dates back at least to the time of Justice Brandeis, who in 1932 famously analogized the states in our federal system to “labo-

5. This attitude extends beyond patent law into other areas of intellectual property. In the words of Professor Dinwoodie, “it is a truism that contemporary problems in copyright law demand international solutions.” Graeme B. Dinwoodie, *A New Copyright Order: Why National Courts Should Create Global Norms*, 149 U. PA. L. REV. 469, 471 (2000). This Article will, however, focus on the demands and history of patent law.

6. See, e.g., Friedman, *supra* note 1, at 399; McConnell, *supra* note 1, at 1498.

rator[ies]” that could experiment with new social and legal innovations.⁷ Nevertheless, formal economic models of interjurisdictional legal diversity and competition often do not account for the possibility of legal innovation,⁸ and some law and economics scholars have questioned the validity of Justice Brandeis’s insight.⁹ Indeed, one scholar, Frank Easterbrook, discounts Brandeis’s views on legal experimentation as based on “Panglossian assumptions.”¹⁰

Moreover, even among scholars who study the process of legal innovation, the long-term value of legal innovation remains open to question. Legal innovation might be merely a product of ideological swings, with today’s regulatory innovation being undone by tomorrow’s deregulatory innovation.¹¹ If so, the long-term value of innovation might be slight. Alternatively, legal innovation might be thought necessary to adapt law to the unique conditions of a particular time and culture. Legal innovations would then have a significant value—much in the way that a new phone-

7. *New State Ice Co. v. Liebmann*, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting).

8. See, e.g., Wallace E. Oates & Robert M. Schwab, *Economic Competition Among Jurisdictions: Efficiency Enhancing or Distortion Inducing?*, 35 J. PUB. ECON. 333 (1988); Tiebout, *supra* note 1. In the legal literature too, some analyses of jurisdictional diversity do not consider the possible value of legal innovation. See, e.g., Avi-Yonah, *supra* note 1; Revesz, *Rehabilitating Interstate Competition*, *supra* note 1; Roin, *supra* note 1.

9. See, e.g., Susan Rose-Ackerman, *Risk Taking and Reflection: Does Federalism Promote Innovation?*, 9 J. LEG. STUD. 593 (1980).

10. Easterbrook, *supra* note 1, at 50 n.58. Judge Easterbrook still values legal diversity, but he focuses on the check that interjurisdictional competition imposes on the governmental “monopoly of lawmaking.” *Id.* at 50. Such a view need not acknowledge the possibility of legal innovation and progress.

11. See, e.g., Bradley C. Canon & Lawrence Baum, *Patterns of Adoption of Tort Law Innovations: An Application of Diffusion Theory to Judicial Doctrines*, 75 AM. POL. SCI. REV. 975, 976 (1981) (noting that legal innovations in tort law during the nineteenth century tended to be “defendant-oriented,” but thereafter innovations tended to favor plaintiffs as “courts—along with other agencies—became more concerned with the social cost of the industrial revolution for injured workers and consumers”); Robert L. Savage, *Diffusion Research Traditions and the Spread of Policy Innovations in a Federal System*, PUBLIUS: J. FEDERALISM, Fall 1985, at 1, 26 (comparing the process of policy innovations to “the constant fluctuations associated with the ebb and flow of cultural ideas” and suggesting that the process may exhibit some “circularity”); see also Roberto Romano, *Law as a Product: Some Pieces of the Incorporation Puzzle*, 1 J.L. ECON. & ORG. 225, 235 n.10 (1985) (noting that, “[a]lthough the direction of state corporation law has been toward deregulation, this is not always the case: antitakeover statutes, for instance, diffused rapidly among the states”).

book is more valuable than an old one—but there would not necessarily be any sense of *progress*, any sense that the law is getting *better* with time.¹²

Legal innovation would be most valuable, however, if it were like technical innovation—i.e., if it were a permanent, nonobvious addition to the storehouse of useful knowledge. Under this view, a diverse legal system has positive externalities for other legal jurisdictions precisely because it provides information to the other jurisdictions about the value of different legal rules. When that information shows the efficacy of a particular legal rule, other jurisdictions may change their laws to adopt the new rule. In this way, the other jurisdictions benefit from the mere fact of difference, and the technology of law advances.

It is here that patent law can enrich the general theoretical discussion, for the history of patent law demonstrates not only the reality and value of progress in legal technology, but also the necessity of legal diversity in fostering that progress. Indeed, the entire field of patent law owes its birth not to harmony but to diversity of law. The fifteenth century Venetian statute that pioneered patent law was an experiment in law, and a departure from the classical hostility to government-sanctioned exclusive rights.¹³ Since then, individual nations have varied their patent law and practice, with other jurisdictions following where the experiment was deemed successful. At least some of these innovations resulted in permanent legal advances. This process of experimentation and innovation continues today. For example, business methods patents and the experimental use defense have generated great differences of opinion among courts and legal commentators, and a diversity of approaches among nations.¹⁴ These past and current experiments in law invigorate and strengthen patent law with new innovations.

12. See, e.g., Romano, *Law as Product*, *supra* note 11, at 280 (describing state efforts at corporate law reform as a process of continual “updat[ing]” of the law needed to “service its corporate clientele”); G. Alan Tarr, *Models and Fashions in State Constitutionalism*, 1998 WISC. L. REV. 729, 735-36 (suggesting that changes in state constitutions occur because “constitutional models appropriate at one point in time may become outdated”). A slight variation of this view would be that legal variation occurs largely in “rules that either (a) do not matter much, or (b) raise issues about which reasonable people (even in the same culture) could disagree.” Saul Levmore, *Variety and Uniformity in the Treatment of the Good-Faith Purchaser*, 16 J. LEG. STUD. 43, 44 (1987). Under this view, legal variation and “innovation” may occur, but the law itself would not develop much—we would observe that “many of the legal problems we grapple with today are precisely those confronted—with ingenuity at least equal to our own—by civilizations long ago,” and modern legal solutions would be “not necessarily superior to others.” *Id.* at 65.

13. See *infra* note 72 and accompanying text.

14. See *infra* Part III.B.

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None of this denies that consistency has merit too. For example, the United States has maintained a uniform, national patent system since 1790. Accepting the value of diversity does not lead to the conclusion that each of the fifty states should administer its own patent system. Nor does it even suggest that each nation-state should maintain its own patent system. Just as in private industry, a certain amount of consolidation may increase not only social welfare, but also competition. Thus, having four or five competing patent systems may be better than having one hundred.

But a complete international harmonization of patent laws—particularly, the institution of a single, integrated global patent system—would eliminate interjurisdictional competition and substantially stifle innovation in patent law. While the loss of competition occurs by definition, the reduction of innovation follows from several effects. First, in a unified global system, experimentation in law could take place only successively, with the entire world serving as the “laboratory” for a particular period of time. Because experiments would be spread out temporally, not geographically, the pace of innovation would necessarily be slower. Second, the resulting “data” from any particular experiment may be much harder to interpret because the experiment lacks a good “control.” Thus, for example, the apparent success or failure of an experiment might be attributable to then-prevailing world conditions; an innovation adopted at the beginning of a worldwide economic recession may appear to be less successful than it actually is. For this reason, experiments conducted on a global scale may produce inconclusive results and slow the rate at which innovations are adopted. Third and finally, conducting experiments on a global scale may be much more difficult than doing so within nation-states or groups of nation-states. Where a global regime is established by multilateral treaty, the process for modifying the agreement may require a worldwide consensus, a significant political barrier to legal experimentation.¹⁵

Aficionados of the patent system—a system built to reward risky experimentation—are particularly well-suited to appreciate the costs that such a development would entail. It would be both ironic and unfortunate if a legal system that owes its existence to experimentation, and that is designed to foster experimentation in technical areas, were modified to pre-

15. For example, amendments to the TRIPS agreement can generally be accomplished only with the support of a two-thirds majority of WTO Members. Moreover, such amendments must be both approved by the WTO’s Ministerial Council (which is composed of representatives from the WTO Members) *and* adopted at the national level by the individual Members. See Agreement Establishing the World Trade Organization, art. X, para. 1, 3, *available at* http://www.wto.org/english/docs_e/legal_e/04-wto.pdf.

clude substantial experimentation and further development of its own norms.

Part II of this Article provides a theoretical analysis of harmony and diversity in patent law. While this analysis finds strong reasons favoring a certain degree of harmonization, it also uncovers significant justifications for maintaining some diversity in patent law. At least one of these justifications for diversity—the value of diverse laws to match local preferences—has previously been mentioned by other patent law scholars. The value of diversity in fostering legal innovation has not. Part III explores this innovation rationale from a historical perspective and demonstrates that many valuable features of modern patent law began as controversial experiments in local systems. As shown in Part III.B, such experimentation continues today, with individual patent systems taking different approaches on controversial topics in the field. Part IV details the implications of these theoretical and historical analyses. If patent law's tradition of innovation is to continue, global patent law must maintain a degree of jurisdictional diversity. Part IV.A suggests ways to interpret TRIPS to achieve that goal, while Part IV.B suggests future steps in which a certain degree of additional patent harmonization can occur without compromising the value of diversity. Finally, Part V offers some concluding thoughts.

VII. THEORETICAL REASONS FOR HARMONY AND DIVERSITY

Finding the optimal balance between legal uniformity and diversity requires an analysis of the factors favoring each side. The analysis here is necessarily limited to qualitative assessments because, as is often true in other areas of law, quantitative measures of the costs and benefits of legal diversity are currently not possible. Nevertheless, even a qualitative analysis is valuable because it can explain the impulses for harmonization and identify circumstances in which the need for diversity is particularly great.

A. The Case for Harmonization

Legal harmonization—whether accomplished by consolidation of previously independent regimes or by less dramatic measures—is usually viewed as an appropriate response to three problems: jurisdictional externalities, economies of scale in governance, and destructive protectionism. The case for harmonization in patent law rests mainly on the first two of these.

1. *Jurisdictional Externalities*

The most compelling justification for harmonization in patent law mirrors the justification for creating a patent system in the first place, for both are efforts to account for the positive externalities associated with the creation of technical information. In a market economy, free competition between firms is thought to produce efficient outcomes provided that, among other things, each firm internalizes all the social costs and benefits of its own activities.¹⁶ In the absence of a patent system, however, that condition does not hold because the production of easily appropriated knowledge will have positive external benefits.

Consider, for example, the situation in which one firm produces a valuable, innovative product that can be easily reverse-engineered. Once it is marketed, the innovation will be quickly copied by the firm's competitors, and the price will be driven down to the marginal cost of manufacturing copies. Accordingly, the innovating firm will be unable to capture the full social benefit of its innovation—innovation will have positive externalities—and the incentives to invest in research and development will be inefficiently low. The patent system can be accurately described as a regulatory mechanism that attempts to correct this externality by more closely aligning the private and social value of producing new information.¹⁷

16. This point is generally known as the “First Fundamental Theorem of Welfare Economics.” See ANINDYA SEN, *MICROECONOMICS: THEORY AND APPLICATIONS* 372-75 (1999). In the text, the concept of “efficient outcomes” is used in the pareto sense: The outcome is pareto efficient if no individual can be made better off without making another individual worse off. Also the concept of an externality implicitly assumes that transactions costs are not zero. As Ronald Coase demonstrated, in a world with zero transaction costs (i.e., a world with a perfectly functioning price mechanism), all “externalities” are internalized because actors causing externalities bear the opportunity cost of forgoing activity and receiving payments from those negatively affected by the externality. See Ronald Coase, *The Problem of Social Cost*, 3 *J.L. & ECON.* 1, 13 (1960) (“It is one of the beauties of a smoothly operating pricing system that . . . the fall in the production due to the harmful effect would be a cost for both parties.”). For the remainder of this article, any discussion of externalities includes an assumption of nonnegligible transaction costs.

17. If this description of the patent system is correct, one might rightly question why patent terms are not infinite, for an infinite patent term would, at first blush, seem to provide a perfect alignment of private and social values. One good answer is that the social value of the innovation at any given time encompasses not only all future benefits associated with the innovation, but also the opportunity cost of “mining out” the innovation at that particular time. See generally Yoram Barzel, *Optimal Timing of Innovations*, 50 *REV. ECON. & STAT.* 348 (1968). In a system of free competition for infinite patents, each competing firm will not internalize the social opportunity cost and will thus have too great an incentive to innovate. The limited patent term attempts to account for this effect.

Just as the externalities provide a justification for the existence of a patent system, so too do they provide a reason for harmonization. Consider, for example, the situation in which one country maintains a patent system but its neighbor does not. Because of the incentives of the patent system in the first country, firms will invest resources in developing patentable innovations. Consumers in the first country will pay above-marginal-cost prices for those innovations and will thus bear the cost of the information necessary to develop the innovations. By contrast, consumers in the second country will, if competitive conditions prevail, pay only the marginal cost of reproducing the innovation; they will free-ride off the investments of their neighbors. The legal regime in the first country thus has a positive externality for the second country.

As the literature on jurisdictional competition consistently demonstrates, such an externality provides a good reason to distrust the body of law produced by diverse jurisdictions,¹⁸ and also a justification for some form of transjurisdictional regulation. For example, in a seminal article on the competition between local jurisdictions to provide public goods, Charles Tiebout acknowledges that where “external economies and diseconomies are of sufficient importance, some form of integration [of the competing jurisdictions] may be indicated.”¹⁹ Numerous other articles reach similar conclusions.²⁰

In an era characterized by inexpensive communications and the free flow of information, externalities provide a particularly powerful justification for transnational patent harmonization because one nation’s patent law can create a global externality. By comparison, the externality problem with most environmental controls is limited to some extent by geography; in many cases, stringent environmental laws benefit only neighboring or downwind jurisdictions.²¹ In contrast, the disclosure of new techni-

18. See, e.g., Hay, *supra* note 1, at 617 (“When states can pass laws whose costs are borne by outsiders, self-interested behavior by each makes all worse off.”).

19. Tiebout, *supra* note 1, at 423. Tiebout gives as an example the case in which one community sprays its trees to prevent Dutch elm disease and thereby provides an external benefit to neighboring jurisdictions.

20. See, e.g., Revesz, *Rehabilitating Interstate Competition*, *supra* note 1, at 1222 (noting that in the context of pollution regulation, “[t]he presence of interstate externalities is a powerful reason for intervention at the federal level: because some of the benefits of a state’s pollution control policies accrue to downwind states, states have an incentive to underregulate”).

21. See *id.* at 1222-23 (noting that the concern over pollution externalities can be addressed merely by “‘showing’ upwind states the costs that they impose on downwind states”).

cal information in Europe or the United States can travel to the other side of the planet almost instantaneously.²²

The externalities argument in fact explains much of the most significant step in patent harmonization, the TRIPS agreement. The negotiations leading to TRIPS were essentially negotiations between industrially developed and less-developed countries.²³ Developed countries entered the negotiations with much stronger patent and intellectual property (IP) systems than those in the developing nations. In other words, the patent systems of the developed countries created positive externalities for the developing nations, which were free-riding on the technological information produced in more developed countries.²⁴ The goal of the developed nations (led by the U.S.) was to increase IP protections in developing countries. In exchange, developing countries obtained more open markets for their textile and agricultural products in developed nations.²⁵ In effect, the TRIPS negotiations may be viewed as a form of Coasian bargain, with developing countries accepting valuable consideration in exchange for their agreement to adopt a legal system addressing the positive externalities problem.

The positive externalities associated with the IP systems also explain the overarching structure of the TRIPS agreement. If positive externalities were the chief concern of the parties in negotiating TRIPS, then the parties should be concerned only that a country may be providing *too little*, not *too much*, IP protection. A nation that decides to depart from an international norm and provide greater IP protection would only provide a benefit to other nations. In other words, the resulting treaty should mandate only *minimum* standards and, in fact, that is precisely what TRIPS does.²⁶ It provides only a harmonized floor; countries remain free to experiment

22. For example, both U.S. and European patents and patent applications are available worldwide on the Internet through governmental and private services. *See, e.g.*, <http://www.uspto.gov/patft/index.html> (US patents available from governmental service); <http://ep.espacenet.com> (European patents available through private service); <http://www.delphion.com> (US patents available through private service).

23. *See, e.g.*, JAYASHREE WATAL, INTELLECTUAL PROPERTY RIGHTS IN THE WTO AND DEVELOPING COUNTRIES 9-47 (2001) (detailing the negotiation process).

24. *See id.* at 12 (noting that some developing countries “ha[ve] entrenched domestic interests producing and profiting from credible equivalents of products protected by IP elsewhere” and that, “[i]n some cases, like India, the interests of these powerful lobbies coincided with those of the consuming public”).

25. *See id.* at 20, 44-45.

26. *See* TRIPS Agreement, *supra* note 4, art. 1.1 (“Members may, but shall not be obligated to, implement in their law more extensive protection than is required by this Agreement, provided that such protection does not contravene the provisions of this Agreement.”).

with more stringent patent rights. For example, TRIPS Article 33 provides that the term of patents “shall not end before the expiration of a period of twenty years counted from the filing date.”²⁷ Countries remain free to experiment with longer terms and, in fact, the United States recently exercised that option by providing patentees with certain patent term “adjustments” that extend the term where the PTO has failed to meet certain statutory goals during the prosecution of the application.²⁸

TRIPS also provides little harmonization in areas where the laws of major industrialized countries diverge. For example, TRIPS makes disclosure of a “best mode” optional, does not require or forbid administrative opposition procedures, leaves nations free to choose a first-to-invent or a first-to-file patent priority rule, and imposes no obligation for countries to grant a “grace period” within which inventors can disclose their inventions without destroying their own novelty.²⁹ These unaddressed points represent areas where the laws of other developed countries differ but, more importantly, they are also areas where the externalities associated with choosing one approach or the other are indeterminate or insignificant: It is simply not clear whether nations with first-to-file rules create positive externalities for nations with first-to-invent rules, or vice-versa. Since TRIPS was designed primarily to address an externality problem, it does not harmonize law on such matters. Similarly, TRIPS imposes only minimal regulation on the patent application process. It demands only that Member nations grant rights using “reasonable procedures and formalities” and that they do so “within a reasonable period of time so as to avoid unwarranted curtailment of the period of protection.”³⁰ Thus, TRIPS produces no substantial savings on the administrative costs of obtaining worldwide patent rights. This approach is consistent, however, with the view that TRIPS is directed mainly to the pre-existing externalities created by the divergent substantive patent laws.³¹

27. *Id.* art. 33.

28. See 35 U.S.C. § 154 (Supp. 2001), amended by The Intellectual Property and Communications Omnibus Reform Act of 1999, Pub. L. 106-113, 113 Stat. 1536 (1999).

29. See TRIPS Agreement, *supra* note 4, art. 29.1 (permitting but not requiring best mode disclosures); *id.* art. 62.4 (permitting but not requiring opposition procedures).

30. *Id.* art 62.1 & 62.2.

31. The externalities argument assumes that the patent system is designed to encourage the production of useful public information. By contrast, early patent systems were designed around a mercantilist theory; the underlying idea then was “to lure emigrants with desirable skills and know-how with the promise of an exclusive privilege.” ROBERT P. MERGES, PATENT LAW AND POLICY 5 (2d ed. 1997). This conception of a patent system explains, for example, the early practice of allowing so-called “patents of importation”—patent rights granted on technologies new to the country granting the pat-

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Despite its theoretical strength and its power in explaining the TRIPS agreement, the externalities argument has significant limitations as a justification for comprehensive global patent harmonization. Most importantly, while positive externalities can lead regimes to free-ride by adopting sub-optimal patent protection, externalities do not necessarily lead to a race to the bottom where each jurisdiction progressively reduces patent protection down to nothing. Even assuming that technical knowledge produced by a patent system benefits all individuals in the world equally (an extreme assumption), each country still has an incentive to adopt a patent system because its citizenry will benefit from the incremental increase in technical progress fostered by its patent system. Where the country is sufficiently large (in terms of population, wealth, and inventive capacity), that benefit may outweigh the value of free-riding on other systems.

For example, consider a world consisting of only two countries: one large—say, the United States—and the other small—say, Monaco. For the United States, the incentives to adopt a patent system are almost identical to those that would exist if there were no externalities. The external effects of the system on Monaco are sufficiently small so as to be ignored. The reverse, of course, is not true. Assuming that competition will drive price to marginal cost where no patent protection exists, the residents of Monaco will reap enormous benefits by free-riding on the inventions produced by the U.S. patent system. However, they would gain little by adopting their own patent system because Monaco's patent system would increase world technical progress only a small amount.

The historical development of patent law reflects the limited effect of externalities; many nations adopted patent systems even prior to any significant international cooperation. By the early nineteenth century, patent systems existed in the United States, England, France, Russia, Austria,

ent, but previously known in other countries. *See id.* (discussing patents of importation); *see also* EDITH TILTON PENROSE, THE ECONOMICS OF THE INTERNATIONAL PATENT SYSTEM 89 (1951) (noting that patent law “grew up in an environment of protectionism” and “[e]conomic provincialism,” with patent systems designed according to then current ideas “regarding the most effective methods of stimulating the growth of national industry”). Under a mercantilist view, jurisdictions with patent systems do not necessarily produce positive externalities for other jurisdictions. Indeed, they may be seen as imposing *negative* externalities (by luring away skilled artisans from elsewhere). The history and structure of TRIPS—with developed nations bargaining to *raise* world patent standards to a certain *floor*—seems to confirm that nations with strong patent systems perceive those systems as valuable for generating technical information, not for luring desirable individuals or industries from other nations.

Prussia, the Netherlands, and a number of the German states.³² In some jurisdictions, most notably Venice, England and France, rudimentary patent systems date back to the sixteenth century.³³

Other effects also curb the positive externalities associated with a patent system. Many modern inventions involve technologies that exhibit significant economies of scale. For those technologies, patents in a few large markets may be sufficient to confer a de facto worldwide monopoly because the market not covered by exclusive rights is too small to support an effective competitor.³⁴ In such circumstances, consumers in countries without patent systems are not able to free-ride on innovations created elsewhere. Another important limitation on patent externalities is that the technical knowledge developed by a patent system does not benefit everyone in the world equally. Faster computer chips likely have less value to consumers in Bangladesh than in the U.S. and European Union.³⁵ Indeed, some innovations may be highly specific to a particular region. For example, a new composition of cleaner-burning gasoline may have high value to a single region plagued by automobile air pollution—say, California—but little value in other countries, or even in other regions of the same country.³⁶

32. See Fritz Machlup & Edith Penrose, *The Patent Controversy in the Nineteenth Century*, 10 J. ECON. HIST. 1, 3 (1950).

33. See WILLIAM HYDE PRICE, *THE ENGLISH PATENTS OF MONOPOLY* 7-8 (1906) (dating English patent policy back to the middle of the sixteenth century); *id.* at 5 (concluding that “the earliest systemic use of patents in France dates from the closing years of the sixteenth century”); Frank D. Prager, *A History of Intellectual Property from 1545 to 1787*, 26 J. PAT. OFF. SOC’Y 711, 724 (1944) (noting that between 1550 and 1600 England was granting about one patent per year, while France was granting about one every two years). These early systems were not entirely stable. For example, abuse of the English patents at the end of the sixteenth century made the system hardly recognizable as structure for rewarding innovation. See PRICE, *supra*, at 8-9 (noting that the English system began issuing patents without regard to novelty). Early patent law was also very rudimentary. See Prager, *History of Intellectual Property*, *supra*, at 725 (noting that France adopted the first recognizable patent examination procedure by royal decree in 1699).

34. Thus, a car manufacturer need not obtain patent rights in Monaco because the country’s market is too small to support a car manufacturer.

35. Because of this effect, even where a firm does have worldwide exclusive rights, it will engage in price discrimination and sell the patented product at a lower price in those areas where demand is lower.

36. See, e.g., *Union Oil Co. of Cal. v. Atl. Richfield Co.*, 208 F.3d 989 (Fed. Cir. 2000) (sustaining the validity of a patent on clean burning fuels that were expected to be used in California). The patent sustained in the *Union Oil* case is controversial because it covers gasoline formulations mandated by state regulation. See Janice M. Mueller, *Patenting Industry Standards*, 34 J. MARSHALL L. REV. 897, 897-901 (2001) (detailing the

A more fundamental objection to using patent externalities to justify comprehensive harmonization is that externalities can be addressed as effectively by more limited measures.³⁷ The simplest way to prove this point is to imagine a world with fully harmonized patent standards across all jurisdictions. Now assume one jurisdiction changes its patent law by (1) narrowing the scope of patent rights somewhat, but also (2) expanding the patent term to compensate. If the legal modifications do not change the net expected value of rents from patents (*ex ante*), then the modified patent system will provide inventors the same incentives to innovate and will address the externalities problem as well as the harmonized system despite the difference in legal systems. Of course, the assumption here—that two patent systems could be said to generate the same net rents—may seem unrealistic because of the extraordinary difficulty of determining what incentives are actually created by any particular patent system. But in fact, that informational difficulty actually helps the argument because, *ex ante*, inventors will view the incentives created by two patent systems as identical provided that discerning any differences is sufficiently costly.

Again, the structure of TRIPS seems consistent with this limitation on the externalities argument. TRIPS generally mandates that signatory countries provide broadly *similar* patent systems. It does not delve much into the details of systems in part because the precise effects of those details are not known with certainty. Thus, as previously mentioned, it remains uncertain which of the various technical differences between the patent systems of industrialized nations produces the better incentives to invent. TRIPS rightly leaves those matters open for each country's choice.

2. *Economies of Scale in Governance*

Patent systems exhibit economies of scale in certain respects—most obviously in the administrative examination of patent applications. The cost of examining each application does not change whether the patent office serves a jurisdiction covering six million or six billion people. In this respect, the administrative function of a patent office resembles a classic natural monopoly, with its average cost of service continuously declining as its jurisdiction expands. Thus, the efficient solution is monopoly—consolidation of the diverse patent offices into one. Indeed, the argument

controversy). Yet even in the absence of the government regulatory intervention, patents on environmental technologies would have greater value in some regions than in others.

37. See, e.g., Revesz, *Rehabilitating Interstate Competition*, *supra* note 1, at 1222-23 (noting that the externalities associated with environmental regulation do not necessarily justify nationalized environmental standards because externalities can be addressed by more limited steps that eliminate externalities).

for consolidation here is much stronger than it is in private markets. Since existing patent offices are already government monopolies within their respective jurisdictions, consolidation will not have any efficiency losses associated with eliminating existing competition.

Like the externalities point, this economies of scale argument has a great deal of force. Indeed, it provides a good basis for former PTO Commissioner Dickinson's promise that a global patent system will deliver "reduced costs for inventors and for their assignees."³⁸ Because patentees pay filing fees to support the currently duplicative national examination system, they would benefit most from the reduction in administrative costs that would accompany global consolidation of patent offices.

Economies of scale also explain a number of developments in international patent law, including the European Patent Convention (EPC), Patent Cooperation Treaty (PCT) and even the nineteenth century Paris Convention. The EPC, which created the European Patent Office (EPO) and authorized it to serve as an examination office for all EPC member countries,³⁹ is the most obvious example of a reform motivated by the economies of scale associated with examination. The treaty allows patent applicants to prosecute their application through a consolidated patent office with jurisdiction over most countries in Europe. The PCT also provides a very limited administrative consolidation, as it streamlines the early stages of patent prosecution on virtually a global scale, because all major industrialized nations are signatories to the treaty.⁴⁰ Even the Paris Convention effectively provides a very limited form of patent office consolidation by permitting applicants to file in any signatory country and thereby obtain a priority date in all countries.⁴¹

Like the externalities argument, however, an argument based on economies of scale has significant limitations as a justification for harmonization. First, the argument does not necessarily provide a reason to harmonize substantive law. While some substantive patent rules might be relevant to the examination process—e.g., the rules governing priority and grace periods (because they govern the universe of prior art used in ex-

38. See Dickinson, *supra* note 2, at 14-2; see also Mossinghoff & Kuo, *supra* note 3, at 530.

39. See European Patent Convention, art. 4, available at <http://www.european-patent-office.org/legal/epc/e/ar4.html>.

40. See Patent Cooperation Treaty Signatory Parties, available at <http://www.wipo.int/treaties/docs/english/m-pct.doc> (providing a list of the 115 PCT signatory nations) (last updated Jan. 15, 2002).

41. Paris Convention for the Protection of Industrial Property, Mar. 20, 1883, art. 4, 828 U.N.T.S. 305 [hereinafter Paris Convention].

aminations)—others are not. Most obviously, no administrative economy is realized by having patents run for a uniform term. Indeed, the point is demonstrated by the EPC, which authorized a unified examination system but *not* a unified patent right. Thus, a patent issued by the EPO is said to be a “bundle” of national patents, with the precise contours of the substantive rights governed by diverse national laws.

Second, the economies of scale argument explains few of the TRIPS reforms. The TRIPS agreement achieves no degree of administrative consolidation among patent jurisdictions. Moreover, TRIPS did nothing on the substantive issues that could assist in administrative consolidation (priority rules and grace periods), yet did require some degree of harmonization on an issue like patent terms, which cannot be justified by economies of scale.

Third, and perhaps most importantly, administrative examination systems exhibit economies of scale only in limited respects. While the administrative costs of examination do not increase where the jurisdiction gains additional *people subject to the resulting patents*, the costs do rise where the examination system processes additional *applications*. Indeed, in terms of processing applications, examination systems probably exhibit only limited economies of scale. Examining patent applications is a labor-intensive enterprise. Each additional application takes a certain number of examiner-hours, and the price of labor remains relatively constant.

For such an administrative task, a single entity is probably not the optimal solution. A number of competing patent offices with overlapping, worldwide jurisdiction would be better. Patent applicants could choose a patent office for prosecution, and patent offices could compete with each other based on the level of their fees and the quality of their examinations.⁴² To a very limited extent, we can already see the glimmerings of such a system. The jurisdiction of the EPO overlaps with that of national patent offices, and the EPO competes to attract patent applicants. Similarly, the Paris Convention permits any country to establish a world-wide priority date, and at least one nation has begun overtly advertising the efficiency of its patent office in providing this service.⁴³ A system of internationally competing patent offices would demand a certain degree of international cooperation. But it need not demand complete harmonization of patent laws, and it would preserve diversity of administrative approaches.

42. See Part IV.B *infra*.

43. See, e.g., http://www.european_patent_office.org/patlib/country/monaco/pr_indus.htm (touting the virtues of filing a patent application in Monaco, which can provide a Paris Convention filing date for less than 500 French Francs, or about \$70).

3. *Preventing Destructive Protectionism*

A final reason to favor some form of transjurisdictional arrangement is to restrain protectionist impulses. The reason is based on the view, supported by empirical data, that protectionism reduces overall social welfare.⁴⁴ However, this reason justifies only very limited transjurisdictional regulations that preclude discrimination against free trade.⁴⁵

The desire to restrain welfare-decreasing protectionism can be seen in the contemporary American jurisprudence regarding the dormant Commerce Clause, which generally precludes state discrimination against interstate free trade and is justified as a means to achieve the desirable goal of a national common market.⁴⁶ It also accounts for the overarching structures of the General Agreement on Tariffs and Trade (GATT), which generally precludes discrimination against international trade between member nations but otherwise leaves nations free to have diverse sets of regulatory laws.⁴⁷

The anti-discrimination justification explains only a few parts of TRIPS—e.g., Article 27’s requirement that patent rights be “available and . . . enjoyable without discrimination as to the place of invention . . . and whether products are imported or locally produced,”⁴⁸ and the more general requirement in Article 3 that “[e]ach [WTO] Member shall accord to the nationals of other Members treatment no less favourable than it accords to its own nationals with regard to the protection of intellectual property.”⁴⁹ Some of the anti-discrimination rules in TRIPS were already

44. See John O. McGinnis & Mark L. Movsesian, *The World Trade Constitution*, 114 HARV. L. REV. 511, 524-26 (2000) (reviewing the evidence that protectionism decreases social welfare).

45. See *id.* at 549-72.

46. *Reeves, Inc. v. Stake*, 447 U.S. 429, 436-37 (1980) (“the Commerce Clause responds principally to state taxes and regulatory measures impeding free private trade in the national marketplace”); *Hunt v. Wash. State Apple Adver. Comm’n*, 432 U.S. 333, 350 (1977) (justifying dormant Commerce Clause jurisprudence by reference to “the Commerce Clause’s overriding requirement of a national ‘common market’”).

47. See McGinnis & Movsesian, *supra* note 44, at 516-17 (stating general thesis that the GATT and World Trade Organization structures are designed to restrain protectionism through an “antidiscrimination model” of regulation).

48. TRIPS Agreement, *supra* note 4, art. 27.1.

49. *Id.* art. 3. See also *id.* art. 1.3 (“Members shall accord that treatment provided for in this Agreement to the nationals of other Members.”); *id.* art. 4 (“With regard to the protection of intellectual property, any advantage, favour, privilege or immunity granted by a Member to the nationals of any other country shall be accorded immediately and unconditionally to the nationals of all other Members.”)

imposed throughout much of the world by the Paris Convention.⁵⁰ But in any event, given the existence of the anti-discrimination norms in TRIPS, few if any additional transnational regulations could be justified as measures to preclude destructive protectionism.

B. The Case for Diversity

A review of the justifications for harmonization shows that, while no clear reason exists for a comprehensive integration of global patent law, there are reasons for supporting particular forms of transnational regulation. Yet these justifications for harmony must be balanced against the costs of harmonization—or, otherwise stated, the values of diversity.

1. Matching Local Preferences

The theoretical literature on jurisdictional legal variation posits that the primary reason for such variation is to permit each jurisdiction to match its laws to the unique tastes and preferences of its population.⁵¹ The argument has strong and weak versions. The strong version assumes individuals are free to move between jurisdictions and concludes that, under certain assumptions, the resulting diversity of laws between jurisdictions reflects an *optimal* provision of public goods.⁵² While this version of the argument is important for diversity in local and state jurisdictions, it has little force in the international setting because changing nationality is relatively expensive for individuals.

More relevant in the international context is a weaker version of the argument, which assumes a stable set of preferences within each jurisdiction and concludes that the diverse laws of each jurisdiction *more closely match* the individual preferences within the jurisdiction than would a uniform set of laws imposed across all jurisdictions. Professors McGinnis and Movsesian rely on this argument in explaining why the GATT/WTO structure does not attempt to harmonize worldwide regulatory law:

50. See Paris Convention, *supra* note 41, art. 2 (mandating that “[n]ationals of any country of the Union shall, as regards the protection of industrial property, enjoy in all the other countries of the Union the advantages that their respective laws now grant, or may hereafter grant, to nationals”).

51. See, e.g., Daniel B. Rodriguez, *Turning Federalism Inside Out: Intrastate Aspects of Interstate Regulatory Competition*, 14 YALE L. & POL’Y REV. & YALE J. ON REG. (Symposium Issue) 149, 154 (1996) (“The essential insight of classic economic arguments for state variation . . . is that communities are different, and these differences are essential and reasonably impervious to efforts at homogenization.”).

52. See, e.g., Tiebout, *supra* note 1.

Uniform health, labor, safety, and environmental regulations are unlikely to be appropriate for all members of the world trading community, as members of the WTO vary widely in their levels of development. As a result, they will rationally choose different regulatory standards. It is wrong to assume, for example, that Indian and American regulations on water purity should necessarily be the same. Indians may not be able to afford American water safety standards, just as they unfortunately cannot afford many other goods that Americans can.⁵³

A similar point is made in the patent context by Professors Dreyfuss and Lowenfeld, who advance the following argument for flexibility in the application of TRIPS:

More fundamentally, we are skeptical that there will always be a “best” rule for every problem that will arise under the TRIPS Agreement. Promoting innovation requires that care be taken not to raise the cost of knowledge to so high a level that it impedes further inventiveness. How that problem is best solved can depend on a country’s intellectual and industrial development, its culture, and the types of creative work in which its citizens are engaged. Thus, the nature (and advantage) of a minimum standards regime is that where there is no “best” rule that will work in every economy, each country can tailor the law to its own needs.⁵⁴

Like McGinnis and Movsesian, Dreyfuss and Lowenfeld suggest that one obvious example of inappropriate uniformity would be applying rules from “highly developed countries” in the less-developed world. The concern here is consistent with the general theory, for the widest divergence of preferences might well be found between developed and less-developed countries.

TRIPS expressly recognizes the value of local diversity. Its very first article guarantees that “Members shall be free to determine the appropriate method of implementing the provisions of this Agreement within their

53. McGinnis & Movsesian, *supra* note 44, at 552-53.

54. See Rochelle Cooper Dreyfuss & Andreas F. Lowenfeld, *Two Achievements of the Uruguay Round: Putting TRIPS and Dispute Settlement Together*, 37 VA. J. INT’L L. 275, 296 (1997); see also Claudio R. Frischtak, *Harmonization Versus Differentiation in Intellectual Property Regimes*, in GLOBAL DIMENSIONS OF INTELLECTUAL PROPERTY RIGHT IN SCIENCE AND TECHNOLOGY 89, 90 (Mitchel B. Wellerstein et al. eds. 1993) (arguing that intellectual property regimes should be “differentiated according to the level of technological and productive competence, so as to support a country’s ability to absorb, adapt, and generate technology”).

own legal system and practice.”⁵⁵ Similarly, Article 27, which generally mandates that patents shall be available in all fields of technologies, allows countries to create exceptions from patentability “necessary to protect *ordre public* or morality”⁵⁶—a standard understood to “depend[] to a certain degree on the particular culture of a country or region.”⁵⁷ Consistent with theory, the TRIPS Preamble explicitly recognizes “the special needs of the least-developed country Members in respect of maximum flexibility in the domestic implementation of laws and regulations in order to enable them to create a sound and viable technological base.”⁵⁸ Special provision is also made for countries and nations “in the process of transformation from a centrally-planned into a market, free-enterprise economy,” both of which are likely to have preferences that widely diverge from those in developed, free-market nations.⁵⁹

There are two significant limitations on this local preferences argument. First, harmonized patent law does not result in the same degree of uniformity that, for example, a harmonized minimum wage law does. The patent right does not mandate any particular price for an innovation. Patentees are free to sell their inventions and license their rights on different terms in different areas. In fact, the available evidence demonstrates that patentees often do engage in price discrimination—for example, by lowering the prices of patented drugs in poorer countries.⁶⁰

55. TRIPS Agreement, *supra* note 4, art. 1.1; *see also id.* Preamble (stating as a goal of the agreement establishing “new rules and disciplines concerning . . . the provision of effective and appropriate means for the enforcement of trade-related intellectual property rights, taking into account differences in national legal systems”).

56. *Id.* art. 27.2.

57. DANIEL GERVAIS, *THE TRIPS AGREEMENT: DRAFTING HISTORY AND ANALYSIS* ¶ 2.134, at 149 (1998) (referring specifically to the morality standard and describing the *ordre public* standard by reference to the principles necessary to sustain the institutions of a “given society”).

58. TRIPS Agreement, *supra* note 4, Preamble; *see also id.* art. 66 (granting certain exceptions to accommodate the “special needs and requirements of least-developed country Members, their economic, financial and administrative constraints, and their need for flexibility to create a viable technological base”).

59. *See id.* art. 65.

60. *See, e.g.,* Robert Weissman, *A Long, Strange Trips: The Pharmaceutical Industry Drive to Harmonize Global Intellectual Property Rules, and the Remaining WTO Legal Alternatives Available to Third World Countries*, 17 U. PA. J. INT’L ECON. L. 1069, 1116-17 (1996) (noting that “drug prices vary substantially across borders” because, among other reasons, “pharmaceutical companies will charge what the ‘market will bear’”) (quoting Frederick T. Schut & Peter A.G. Van Bergeijk, *International Price Discrimination: The Pharmaceutical Industry*, 14 WORLD DEV. 1141, 1147 (1986)); *see also* John H. Barton, *The Economics Of Trips: International Trade In Information-Intensive Products*, 33 GEO. WASH. INT’L L. REV. 473, 481-82 (2001) (noting that, for information-

Second, and more importantly for purposes of this Article, the local preferences argument is less compelling where the diversity occurs between nations having seemingly similar preferences (e.g., between two well-developed nations) than where preferences are likely to be widely divergent (e.g., between developed and developing nations).⁶¹ If local preferences were the sole reason for maintaining legal diversity, a general harmonization of law among similarly situated nations, e.g., among developed nations, might be desirable. But the case for legal diversity does rest wholly on the local preferences argument.

2. *Competition as a Check on Government*

Another common justification for permitting jurisdictional legal variation is that tolerating variation will breed jurisdictional competition, which checks governmental inefficiency and abuse. This is sometimes referred to as the “Leviathan” argument because the competition checks otherwise harmful tendencies of monopolistic governmental power.⁶²

This argument is not, however, a very powerful reason for resisting global patent harmonization. The general limitation on the argument is that, even where harmonization is pursued in a number of legal issues, competition on other points can still provide an effective check on government. The point here is familiar to regulated industries scholars: Even where regulation constrains competition along one axis (e.g., by fixing price), firms can still compete with each other along other axes (e.g., by improving quality). Thus, harmonizing law in one particular area (e.g., IP) would leave jurisdictions free to compete for capital and, to a lesser extent, labor, through jurisdictional differences in other areas of law (e.g., tax policy, environmental standards, etc.).

A more specific problem with this argument is that, in the area of patent law, the current diversity of law is not imposing any significant check on government inefficiency. With few exceptions, the government of each nation still holds a monopoly on the power to issue patents within its borders, and thus government patent offices are not subject to any significant

intensive products protected by intellectual property rights, price discrimination both within and between nations is common and likely to continue).

61. Of course, a broad version of the local preferences argument might presume that any difference in laws should be taken as good evidence of different preferences. With this presumption, however, the argument provides no way to distinguish between those differences that will be respected and those that will not. Since harmonization of law is being pursued in some instances, some means is needed to distinguish between those instances where case for diversity is stronger and those where it is weaker.

62. See Avi-Yonah, *supra* note 1, at 1614; see generally Stefan Sinn, *The Taming of Leviathan: Competition Among Governments*, 3 CONST. POL. ECON. 172 (1992).

competition under the current state of affairs. To the extent that a patent office has incentives to be lazy or abusive, those incentives will not be checked by competition from other jurisdictions. Therefore, consolidation of national offices into a single world patent office would not necessarily have any significant costs in terms of sacrificing competitive checks on bureaucrats.⁶³

3. *Permitting Experimentation and Innovation in the Law*

Tolerating legal diversity may also permit legal innovation to occur more rapidly. The point was made famous by Justice Brandeis, who observed that “[i]t is one of the happy incidents of the federal system that a single courageous state may, if its citizens choose, serve as a laboratory, and try novel social and economic experiments without risk to the rest of the country.”⁶⁴ Legal experimentation and innovation can be valuable not only to the jurisdiction that conducts the experiment, but also to other jurisdictions, which benefit from the information produced by the experiment. Thus, legal diversity has its own externality, which weighs against harmonization.

The innovation rationale has quite different implications than the other reasons supporting diversity. It provides a more substantial basis to oppose patent harmonization than does the Leviathan argument because, as previously explained, enforcing uniformity in one area of law may still permit significant legal competition to check government inefficiency. But *any* degree of harmonization necessarily removes the harmonized point from parallel experimentation by different jurisdictions and is thus likely to significantly retard further development as to that aspect of the law.

An experimentation rationale for opposing harmonization also has different implications than a rationale based on matching local preferences. Effective legal experimentation may occur in nations that have highly similar preferences. Indeed, a nation’s experiment with a legal innovation provides the most direct benefits to nations with similar cultures and preferences, because such nations are likely to have similar experiences with the innovation. Moreover, legal innovations in an area such as patent law

63. However, if national (or private) patent offices were allowed to compete in issuing presumptively valid worldwide patents, subsequent consolidation would destroy a competitive check on patent office efficiency. Such a system would be superior to a single harmonized world patent office. *See supra* note 38 and accompanying text (discussing the alleged economies of scale benefits of a single harmonized world patent office); *see also* Part IV.B *infra*.

64. *New State Ice Co. v. Liebmann*, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting).

are probably more likely to occur in developed nations, which already possess a sophisticated understanding of the area, than in less-developed nations, which do not have long experience with patent systems. It may also be unwise for less-developed nations to undertake risky experiments with their embryonic patent systems, which may not be able to weather a failure. Thus, an experimentation rationale provides a reason for tolerating diversity between developed nations. Indeed, it may be sensible to tolerate more diversity between developed nations than between developed and less-developed nations.

The value of jurisdictional diversity in encouraging legal innovation has remained controversial in the literature. In one leading article, Professor Susan Rose-Ackerman reached “pessimistic” conclusions after analyzing the incentives of politicians in a federal system to take on risky projects and finding that “low-level governments remain flawed mechanisms to rely on in the search for new ideas.”⁶⁵ But even if the incentives are flawed, experimentation and innovation are still possible; harmonization imposes a still greater constraint. Other commentators have been more sanguine than Rose-Ackerman about the contribution of jurisdictional diversity to legal innovation.⁶⁶ The history of patent law provides a valuable lesson here, for it shows that experimentation—even experimentation conducted by large nation-states—can produce significant new ideas in law.

VIII. DIVERSITY AND INNOVATION IN PATENT LAW: A CASE STUDY

The desirability of a harmonized patent law cannot be fairly assessed without some understanding of the important role that legal diversity has played in the history of the field. As demonstrated in Part III.A *infra*, legal experimentation and subsequent change in prevailing legal norms have

65. Rose-Ackerman, *supra* note 9, at 594.

66. *See, e.g.*, Freidman, *supra* note 1, at 399 (listing various examples of innovative state programs and noting that “[c]ommon intuition suggests that the vast majority of techniques used today to govern were developed at the state and local level”); McConnell, *supra* note 1, at 1498 (“A final reason why federalism has been thought to advance the public good is that state and local governmental units will have greater opportunity and incentive to pioneer useful changes. . . . Elementary statistical theory holds that a greater number of independent observations will produce more instances of deviation from the mean. If innovation is desirable, it follows that decentralization is desirable.”); *see also* William W. Bratton & Joseph A. McCahery, *The New Economics of Jurisdictional Competition: Devolutionary Federalism in a Second-Best World*, 86 GEO. L.J. 201, 262 n.246 (1997); Deborah J. Merritt, *The Guarantee Clause and State Autonomy: Federalism for a Third Century*, 88 COLUM. L. REV. 1, 9 n.47 (1988).

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been continuing themes throughout the history of patent law. This process is responsible not only for building essential features of the modern law, but for creating the very subject of patent law. The process of experimentation and innovation continues today and, as shown in Part III.B, it extends to fundamental issues such as the range of patentable subject matter and the scope of exclusionary rights granted by the patent.

The point here is not that significant changes have occurred in patent law; mere change could represent random shifts in fashion, with little permanent value. The point is that legal knowledge has *progressed* through these changes—that the process of local diversity and experimentation has produced permanent, valuable advances in our understanding of legal technology. Moreover, the experiments leading to these advances have been controversial. Though many of these legal variations were eventually adopted universally, they often went against prevailing norms and generated significant opposition in some nations. In other words, if the law had been globally harmonized at the time of these experiments, it would have been harmonized *against* the experiments. And if a global consensus were needed to engage in the experiments, that consensus may not have emerged for a very long time, if ever. Global harmonization threatens to retard this process of innovation; indeed, the threat is already being realized.

A. Historical Examples of Innovation in Patent Law

The relative youth of patent law cannot be overstated. The law of contract, tort, crime, marriage and other areas can find antecedents dating back at least to Roman and Greek law. While specific doctrines and rules in these areas have evolved since antiquity, the fields have nonetheless been recognized for more than two thousand years. The same is not true of patent law. Legal protection of inventions (or, for that matter, other categories of intellectual property) simply did not exist in Roman or Hellenistic law.⁶⁷ Even in its most embryonic form, patent law can be traced back little more than five hundred years, and for all but the last two hundred years the area was so rudimentary as to be barely recognizable. As late as 1850, a structure central to modern law—the patent claim—was so unimportant that the leading treatise of the day did not include the subject in its

67. See BRUCE W. BUGBEE, *GENESIS OF AMERICAN PATENT AND COPYRIGHT LAW* 12 (1967). (“The legal safeguarding of rights in the products of creative thought was virtually ignored in ancient times.”); Edward C. Walterscheid, *The Early Evolution of the United States Patent Law: Antecedents*, 76 J. PAT. & TRADEMARK OFF. SOC’Y 697, 702 (1994) (“Despite occasional argument to the contrary, ancient law failed completely to recognize the concept of intellectual property.”).

index.⁶⁸ In a comparatively short period of time, patent systems have developed a complex body of law that defines property rights in many diverse fields of human creativity. The development of this law provides a case study in legal innovations pioneered by one jurisdiction and then copied by others.

1. *The Invention of Patent Law*

The most obvious example of innovation is the creation of patent law itself, which occurred in Renaissance Italy. Perhaps as early as the fourteenth century, isolated monopolies on industrial developments may have been granted in other European states, but these older grants were most likely made as matters of discretion rather than of right.⁶⁹ They seem little more than exercises in industrial protectionism, rather than a considered policy of encouraging or rewarding technical prowess or innovation. Scholars typically trace the true origins of modern patent law to the fifteenth century Venetian Republic.⁷⁰ In the latter half of the fifteenth century, Venice granted monopoly privileges with increasing frequency for

68. See GEORGE TICKNOR CURTIS, *THE LAW OF PATENTS* 581-604 (1849) (showing no entry covering claims in extensive index to a comprehensive American patent law treatise); William Redin Woodward, *Definiteness and Particularity in Patent Claims*, 46 MICH. L. REV. 755, 760 (1948) (observing that “the courts for a long time did not regard [the claim] as the definitive measure of the scope of the patent” but rather looked to “the whole patent document, including the claims as a guide . . . to ascertain the scope and nature of the invention”).

69. For example, the Duke of Saxony granted what F.D. Prager terms a “quasi-patent” issued to a papermill in 1398. F.D. Prager, *The Early Growth and Influence of Intellectual Property*, 34 J. PAT. OFF. SOC’Y 106, 123 (1952). The recitation in the grant mentions only that the mill is “newly started” and has obtained the Duke’s “grace and favor.” *Id.* at 123-24. The grant, which protected the mill from any competition that might be damaging in any manner, is thus consistent with a policy of industrial protection. See also Hansjoerg Pohlmann, *The Inventor’s Right in Early German Law*, 43 J. PAT. OFF. SOC’Y 121, 122 (1961) (noting that “proto-patents” had been issued in Saxony as early as 1378). Monopoly privileges in glassmaking were also granted in France during the fourteenth century. See Prager, *supra*, at 124. But again, whether these grants were meant to promote technical development, they were also designed to serve other ends of industrial policy. See BUGBEE, *supra* note 67, at 169 n.30 (noting that French privileges “sought to restrict—not stimulate—French glassmaking in order to conserve the forests which provided wood and charcoal for this industry”).

70. See, e.g., BUGBEE, *supra* note 67, at 23 (crediting Venetian Republic with “the world’s first patent system”); Prager, *supra* note 69, at 107-08 (noting that the system of patent monopolies was perfected in Italy, mainly in Venice during the fifteenth century); Walterscheid, *supra* note 67, at 706 (same). Venice’s claim to priority in the development of the first true patent law is based on the work of Giulo Mandich. See Giulo Mandich, *Venetian Patents (1450-1550)*, 30 J. PAT. OFF. SOC’Y 166, 169 (1948) (“We can now claim the priority of Venice in recognizing the *right* of inventors.”).

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allegedly improved industrial devices and processes brought about by the applicant's "skill and experience," "pertinent thoughts and labors," or "efforts, study and ingenuity."⁷¹ This practice was confirmed in a statute of March 19, 1474, which is the first known legislative statement of generally applicable patent principles.⁷²

The concept of patent law quickly spread from Venice to Germany, France and England.⁷³ In Germany, patents on inventions began about ten years after enactment of the general Venetian statute, and some historical evidence suggests that the Venetian patent idea was imported by traveling German businessmen and immigrant Venetian glassmakers.⁷⁴ The idea first appeared in France in 1551 and, tellingly, the first French patent was granted to an Italian.⁷⁵ Similarly, in 1559, an Italian inventor familiar with the Venetian system seems to have been responsible for introducing the concept of patents into England.⁷⁶ Modern evidence of borrowing patent law from other jurisdictions is even stronger. For example, many provisions of Japanese patent law are simply translations of their German counterparts.⁷⁷

71. Mandich, *supra* note 70, at 173-74 (quoting, respectively, Venetian monopoly grants made in 1460 for an improved stove and for a device for raising water, and in 1469 for the newly imported art of printing).

72. *Id.* at 176-77 (setting forth translation of the 1474 statute).

73. The early Venetian statute recognized the concepts of novelty, operability, utility, and an actual reduction to practice. *See* Walterscheid, *supra* note 67, at 709.

74. *Id.* at 711 n.50.

75. Prager, *supra* note 33, at 723.

76. Jeremy Phillips traces the English importation of the patent idea back to Jacobus Acontius, who articulated the concept of patents as a reward for innovation in a petition to Queen Elizabeth I. Acontius was born in Trent, an area dominated by the Venetian republic at the time, and may even have had first-hand knowledge of the Venetian patent system as a patentee under that system. Jeremy Phillips, *The English Patent as a Reward for Invention: The Importation of an Idea*, 3 J. LEG. HIST. 71, 75-77 (1982); *see also* PRICE, *supra* note 33, at 7 (tracing the English concept of patents back to the petition filed by Acontius).

77. Toshiko Takenaka, *Harmonizing the Japanese Patent System with its U.S. Counterpart Through Judge-made Law: Interaction Between Japanese and U.S. Case Law Developments*, 7 PAC. RIM L. & POL'Y 249, 250 (1998). Though its patent code resembles German law, Japan also looked to the patent experience of United States. The Japanese patent system was created in 1899, after a special delegation visited the U.S. Patent Office. One envoy was said to have remarked: "[W]e have looked about us to see what nations are the greatest, so that we could be like them; . . . and we said, 'What is it that makes the United States such a great nation? and we investigated and we found it was patents, and we will have patents.'" B. Zorina Khan, *Property Rights and Patent Litigation in Early Nineteenth-Century America*, 55 J. ECON. HIST. 58, 59 n.4 (1995) (quoting account provided in STORY LADD, PATENTS IN RELATION TO MANUFACTURES (1900)).

The creation of patent law was not, however, free from controversy. In fact, the possibility of providing some legal reward for innovation had been raised long before the Italian Renaissance, but the reaction recorded in Aristotle's *Politics* is typical of the classical hostility to the idea.⁷⁸ Aristotle considered the proposal by Hippodamus of Miletus that "some honour ought to be conferred on those who suggest an improvement which is of benefit to the city," but concluded that it "cannot be safely enacted, and has only a specious sound."⁷⁹ In detailing his objections to Hippodamus's proposal, Aristotle focused on providing rewards for improved laws, which he considered dangerous because "[t]he law has no other source of strength through which to secure obedience apart from habit."⁸⁰ Even if Aristotle meant to criticize Hippodamus' proposal only in so far as it would encourage innovations in law,⁸¹ the criticism still created a barrier to the development of patent law and intellectual property law in general. Intellectual property law would be a significant legal innovation and, under Aristotle's view, legal "change is a matter which needs great caution."⁸² Caution in intellectual property would mean more than one and a half millennia without significant legal innovation in the field. The creation of the patent law would occur only after the dissolution of classical societies and the rise of numerous, advanced, competing jurisdictions, some of which were willing to try the unconventional idea.

The controversy surrounding patent law continued even as the idea spread throughout Europe. Indeed, in the nineteenth century (shortly after many European nations first adopted patent laws), a wave of opposition stopped the spread of law and, in Holland's case led to its repeal.⁸³ This tide of patent opposition did not finally recede until 1910, when Holland reenacted a patent statute.⁸⁴ Thus, even though the concept of patents had been pioneered in fifteenth century Venice, at no time before the twentieth

78. TREVOR J. SAUNDERS, *ARISTOTLE'S POLITICS TRANSLATED WITH A COMMENTARY* 145 (1995) (noting that "Greek literature on rewards and honours, on social and technical progress, and on the merits and demerits of making changes to laws and customs, is full of echoes of the points made here").

79. *ARISTOTLE, POLITICS*, pt. II.8, at 65 (Ernest Barker trans., 1995).

80. *Id.* at 66. Aristotle also believed that changes in law were undesirable, as people sought change merely for the reward. *See id.* at 65; SAUNDERS, *supra* note 78, at 145-46.

81. Curiously, Aristotle noted that "[c]ertainly in other branches of knowledge change has proved benefits," and gave examples of improvements "in medicine, in physical training, and generally in all kinds of craft and skill." *ARISTOTLE, supra* note 79, at 65. He does not consider the possibility of limiting Hippodamus' suggestion to those skills, perhaps because even adopting that proposal would be a legal innovation.

82. *ARISTOTLE, supra* note 79, at 66.

83. *See* Machlup & Penrose, *supra* note 32, at 1-6.

84. *See id.* at 6.

century did all major European nations even have patent laws.⁸⁵ If legal change had required global consensus, patent law might have been delayed even longer.

2. *Technical Examination*

The modern patent examination system is another idea that appeared in one jurisdiction and migrated, haltingly, to the rest of the world. Many early patent systems included no regularized system for evaluating the technical merits of the asserted invention over the existing art. The early English patent law, for example, was based on a registration system, with the technical merits of the invention reviewed later in infringement suits.⁸⁶ Institutional review of novelty and utility was first developed in the French patent system, which in 1699 authorized the French Academy of Science to examine patent applications and certify the novelty and utility of the inventions⁸⁷

The French idea of patent examination spread to the United States when Congress enacted the Patent Act of 1790. Congress rejected the English registration system in favor of an examination process similar to the French model.⁸⁸ Congress broke with the French system by having government officials rather than a private organization (or learned society) conduct the examination.⁸⁹ The early U.S. system failed, however, because it imposed the examination duty on high-level government officials who had too little time to discharge this duty effectively.⁹⁰ Accordingly, Con-

85. In 1882, Switzerland became the last industrialized European country to adopt a patent law, but by then Holland had repealed its patent law. *See id.* at 4 (noting that in 1868 “Switzerland was the only industrial country in Europe that had failed to adopt a patent system”); *id.* at 6 (noting that the Swiss adopted a patent law in 1882 but that Holland had no patent law from 1869 to 1910).

86. H.I. DUTTON, *THE PATENT SYSTEM AND INVENTIVE ACTIVITY DURING THE INDUSTRIAL REVOLUTION 1750-1852*, at 60 (1984) (discussing the survival of the English registration system into the mid-nineteenth century); *see also* Mandich, *supra* note 70, at 185-90 (noting that many early Venetian patents contained clauses stating “assuming without deciding that this is a new invention” or similar clauses).

87. *See* Frank D. Prager, *Examination of Inventions from the Middle Ages to 1836*, 46 J. PAT. OFF. SOC’Y 268, 273 (1964) (attributing the French examination system to the mathematician and lawyer Stephen Pascal); *see also* Prager, *supra* note 33, at 752 (quoting the 1699 royal edict that authorized examinations by the Academy).

88. Prager, *supra* note 87, at 289.

89. The U.S. law imposed the examination duty on patent board consisting of the Secretary of State, the Secretary of War and the Attorney General. *See Operation of the Patent Act of 1790*, 18 No. 7 J. PAT. OFF. SOC’Y 63, 64 (1936).

90. *See id.* at 76 (noting that “the most important cause [of the demise of the 1790 Patent Act] was the high position of the administrators, who were occupied with many important affairs of state and could not devote sufficient time to patent matters”). In par-

gress abandoned the system in favor of the English registration model within three years.⁹¹ Still, the early American experience and the French examination system provided precedents, and as dissatisfaction with the American registration system grew in the early nineteenth century, leading figures such as Thomas Jefferson considered the examination system as a remedy.⁹² When the U.S. returned to an examination system in 1836, the development drew upon earlier experiences but also created a specialized bureaucracy to perform the task.⁹³

The English moved toward an examination system slowly and, as they did so, looked to the experience of other nations that already had patent examination. Prior to the 1851 reform of English patent laws, “several Experts provided information on the various patent examination systems in Europe.”⁹⁴ The movement toward a full examination model was delayed due to the English belief that the U.S. examination system was a failure; this belief generated “vigorous and well-organized opposition to examination on the United States model.”⁹⁵ As the examination system became more entrenched in other nations, English opposition to the idea waned. In 1883, in order to deal with an increased number of patents with little or no validity, the English adopted a limited examination system. The English instituted further extensions of examination reforms in 1902 and 1932 and eventually the English system mirrored the examination system found in the U.S. and other countries.⁹⁶ The extended English opposition to the ex-

ticular, Thomas Jefferson, a member of the early patent board by virtue of his office as Secretary of State, worried that time pressures were forcing him “give under & uninformed opinions” on patent applications. Letter from Thomas Jefferson to Hugh Williamson (Apr. 1, 1792), *reprinted in* 6 THE WORKS OF THOMAS JEFFERSON 459 (Paul Leicester Ford ed., 1904).

91. *See Operation of the Patent Act of 1793, supra* note 89, at 76 (noting that “the most important difference” between the 1790 and 1793 acts was the elimination of any process for examining applications).

92. *See* Thomas Cooper, *On Patents*, in 2 EMPORIUM ARTS & SCI. (n.s.) 431, 452 (Thomas Cooper ed., 1814) (quoting a letter from Thomas Jefferson dated August 13, 1813, which recalled the early U.S. patent board and suggested requiring patent applications to be reviewed by “a board of academical [sic] professors”).

93. *See* John F. Duffy, *The FCC and the Patent System: Progressive Ideals, Jacksonian Realism, and the Technology of Regulation*, 71 COLO. L. REV. 1071, 1124-34 (2000) (detailing the origins of the 1836 law creating the modern patent bureaucracy).

94. DUTTON, *supra* note 86, at 60.

95. Edward Armitage, *Two Hundred Years of English Patent Law*, in AMERICAN BAR ASSOCIATION, TWO HUNDRED YEARS OF ENGLISH & AMERICAN PATENT, TRADE-MARK, AND COPYRIGHT LAW 16 (1977).

96. *Id.* at 16-18.

amination system demonstrates once again that legal diversity allowed some jurisdictions to pioneer an experiment that others thought foolish.

3. *Early Publication of Patent Applications*

The history of one of the more recent developments in patent law—publication of pending patent applications eighteen months after filing—is relatively easy to trace. Prior to the 1960s, most countries kept pending applications secret.⁹⁷ In 1964, the Netherlands began publishing applications eighteen months after filing; Germany, Japan, and then almost every other industrialized nation soon followed.⁹⁸ As with other legal innovations in patent law, nations did not just happen to adopt the same idea in sequence. Rather, jurisdictions were following the leader by embracing new ideas successfully introduced elsewhere.⁹⁹

Once again, this idea also had its detractors and, in this case, the United States was the laggard. As late as 1998, opponents of the proposed change were decrying eighteen-month publication as “a disincentive to the inventive process,” “an assault on the small inventor” and a repudiation of fundamental contractual bargain between inventors and the public that “sends shivers down my back.”¹⁰⁰ The United States did not adopt the rule until 1999, and the U.S. version still provides an exemption where the inventor does not intend to file for a patent in any other country.¹⁰¹

B. **Ongoing Experiments**

Innovation in patent law is not limited to historical examples. Though there are other examples of ongoing experiments with new innovations,¹⁰²

97. See Public Hearing and Request for Public Comment on Issues Associated with Implementation of Eighteen-Month Publication of Patent Applications, Patent and Trademark Office 31 (Feb. 15, 1995) (testimony of Professor Harold C. Wegner).

98. See *id.* at 26-27; see also Paul A. Ragusa, Note, *Eighteen Months to Publication: Should the United States Join Europe and Japan by Promptly Publishing Patent Applications?*, 26 GEO. WASH. J. INT’L L. & ECON. 143, 144-45 (1992) (noting the spread of early publication requirement throughout the world).

99. For example, the public debate on whether the U.S. should adopt the early publication rule was informed by the experience of other nations. See, e.g., Symposium, *Early Patent Publication: A Boon Or Bane? A Discussion On The Legal And Economic Effects Of Publishing Patent Applications After Eighteen Months Of Filing*, 16 CARDOZO ARTS & ENT. L.J. 601 (1998) (panel discussion on the proposed U.S. adoption of early publication, with panelists referring repeatedly to the experience of other countries).

100. *Id.* at 624 (statement of Douglas Wyatt, patent attorney); *id.* at 618, 614 (statements of Dr. Robert Rines, professor, patent attorney and inventor).

101. See 35 U.S.C. § 122(b)(2)(B)(i) (Supp. 2001).

102. Examples of ongoing experiments include the availability of grace periods and the establishment of specialty courts for patent cases. See, e.g., *The Patent Office (UK)*, UK Consultation on Grace Periods, available at <http://www.patent.gov.uk/about/>

I will focus here on two of the most significant: the extension of patenting to business methods and the experimental use exception to infringement.

1. *Business Method Patents*

The Federal Circuit's holding in *State Street Bank v. Signature Financial Group* is, by now, very familiar to all patent practitioners. The decision eliminated whatever was left of the business methods exception to patentable subject matter.¹⁰³ The development was presaged by the practice of the PTO, which had already been issuing patents (including the patent at issue in *State Street*) on financial methods and other processes that seemed to fall within the classic business methods exception. Nonetheless, the Federal Circuit's decision brought attention to this development and clarified the law so as to leave no doubt that the business method exception was dead.

In addition to producing an enormous volume of commentary, the *State Street* decision has prodded jurisdictions worldwide to rethink the continued vitality of their business method exceptions. The results of this process so far have been mixed. The Japanese Patent Office (JPO) appears to be following the lead of *State Street* in permitting patents on business methods.¹⁰⁴ Australian courts also appear receptive to the development.¹⁰⁵

consultations/grace/index.htm (initiating public discussion as to whether the UK should adopt a grace period and setting forth as possible alternatives five models, including ones based on current U.S. and European law); Rochelle Cooper Dreyfuss, *The Federal Circuit: A Case Study in Specialized Courts*, 64 N.Y.U. L. REV. 1, 3 (1989) (noting that, in creating the Federal Circuit, "Congress decided to embark upon a sustained experiment in specialization"), Richard Price, *Patent Litigation in England—Quiet Revolution*, 17 EUR. INTEL. PROP. REV. D-290 (1995) (describing the U.K.'s experience with a new specialized trial court—the Patents County Court—which offers litigants less formal, streamlined procedures to resolve patent disputes). For an example of a nation considering whether to adopt minor innovations from other patent systems, see The Patent Office (U.K.), *Meeting The Future: Consultation On Proposed Changes In Patent Practice And Procedure* ¶¶ 16, 30, 44 (July 31, 2001), available at <http://www.patent.gov.uk/about/consultations/future/future.pdf> (using the experience of other patent offices, including the European and Japanese Patent Offices, to evaluate possible reforms of the UK Patent Office).

103. *State St. Bank & Trust Co. v. Signature Fin. Group*, 149 F.3d 1368, 1375 (Fed. Cir. 1998) ("As an alternative ground for invalidating the . . . patent under § 101, the court relied on the judicially-created, so-called 'business method' exception to statutory subject matter. We take this opportunity to lay this ill-conceived exception to rest.")

104. In a recent press release, the JPO stated that it "intends to continue its efforts to offer appropriate protection of intellectual property rights (IPRs) in this field." Press Release, Japanese Patent Office, Policies Concerning "Business Method Patents," Nov. 2000, available at <http://www.jpo.go.jp/infoe/tt1211-055.htm>.

However, the European Patent Office appears to be maintaining the traditional rule.¹⁰⁶ The global law on the subject is unsettled, and jurisdictions are watching developments elsewhere in the world.

2. *The Experimental Use Exception to Infringement*

In U.S. law, the experimental use exception to infringement liability traces back to Justice Story's 1813 opinion in *Whittemore v. Cutter*, which stated in dicta that:

It could never have been the intention of the legislature to punish a man who constructed [a patented] machine merely for philosophical experiments, or for the purpose of ascertaining the sufficiency of the machine to produce its described effects.¹⁰⁷

The extent of this doctrine remained unclear for more than a century and a half, with few cases testing its limits.¹⁰⁸ In 1984, however, the Federal Circuit eliminated the exception for all practical purposes by holding it “to be truly narrow” and not to extend to research activities with “definite, cognizable, and not insubstantial commercial purposes.”¹⁰⁹

Although, the *Bolar* holding remains controversial among academic commentators,¹¹⁰ the more important point is that many nations are not following the United States on this issue; indeed they seem to be going in the other direction. The United Kingdom, Germany, Japan, Korea and many others expressly recognize an experimental use exception in their

105. *Welcome Real-Time SA v. Catuity Inc.*, (2001) FCA 445, para. 129 (Fed. Ct. Austl. May 17, 2001), available at http://www.austlii.edu.au/au/cases/cth/federal_ct/2001/445.html (finding “[t]he *State Street* decision [to be] persuasive”).

106. *See* *Controlling Pension Benefit Systems Partnership*, T 0931/95-3.5.1 (European Patent Office Bd. of App. Sept. 8, 2000), available at <http://www.european-patent-office.org/dg3/pdf/t950931eu1.pdf> (holding unpatentable a method for administering a pension system).

107. 29 F. Cas. 1120, 1121 (C.C.D. Mass. 1813) (No. 17,600).

108. *See* Rebecca S. Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. CHI. L. REV. 1017, 1019-20 (1989) (noting that “the use of patented inventions in noncommercial research rarely provokes a lawsuit” and thus “the purpose and scope of the experimental use defense are not well defined”).

109. *Roche Prods, Inc. v. Bolar Pharm. Co.*, 733 F.2d 858, 863 (Fed. Cir. 1984).

110. *See, e.g.*, Eisenberg, *supra* note 108, at 1078 (proposing royalty-free experiment use exception to infringement); Janice M. Mueller, *No “Dilettante Affair”*: *Rethinking the Experimental Use Exception to Patent Infringement for Biomedical Research Tools*, 76 WASH. L. REV. 1, 36, 54-55 (2001) (describing the analysis in *Bolar* as “no longer supportable” and arguing in favor of an expanded experimental use limitation on infringement liability but with the experimenter liable to the patent holder for a reasonable royalty—in effect, creating a compulsory license for experimenters).

statutory law.¹¹¹ Perhaps because of the express statutory recognition, those jurisdictions have interpreted the experimental use doctrine broadly in recent cases.¹¹² Yet even Canada, which does not have any express experimental use provision in its statutory law, takes a broad view of the exception in its case law.¹¹³

Interestingly, this diversity of law on the experimental use exception provides incentives for certain industries—specifically, those conducting commercial research on patented technologies hoping to obtain patentable improvements—to locate their research operations outside of the United States. Time and experience will tell whether those incentives impose pressure on the United States to change its law.

IX. IMPLICATIONS

Diversity of law is an ongoing tradition in the patent field. It need not be viewed as a problem in need of a harmonized solution; indeed, experimentation and concomitant jurisdictional diversity may be essential so that the evolution of law in this area keeps pace with rapid technical change. Yet the seemingly relentless drive toward harmonization threatens the continuation of this process. For example, commentators have already in-

111. See, e.g., Patent Act, 1977, ch. 37, § 60(5)(b) (Eng.), reprinted in U.K. PATENT OFFICE, MANUAL OF PATENT PRACTICE (1999), available at http://www.patent.gov.uk/patent/reference/mpp/s60_71.pdf (providing a defense to infringement for actions “done for experimental purposes relating to the subject-matter of the invention”); Japanese Patent Act § 69(1), available at <http://www.jpo.go.jp/shoukaie/patent.htm> (last visited Feb. 28, 2002) (English translation); Korean Patent Law, art. 96(1), available at http://www.kipo.go.kr/english/sub5_index.html (last visited Feb. 28, 2002) (English translation).

112. See, e.g., U.K. PATENT OFFICE, MANUAL OF PATENT PRACTICE, *supra* note 111, § 60.24 (noting that the experimental use exemption in U.K. law extends to commercial experiments and that “[t]rials carried out in order to discover something unknown or to test a hypothesis . . . can fairly . . . be regarded as experiments”); *Klinische Versuche (Clinical Trials) I*, [1997] R.P.C. 623, 639 (F.R.G. BGH) (holding that the German experimental use exception “exempts all experimental acts as long as they serve to gain information and thus to carry out scientific research into the subject-matter of the invention”); *Klinische Versuche (Clinical Trials) II*, [1998] R.P.C. 423, 432 (F.R.G. BGH) (clarifying that German experiment use exemption is available even for commercial experiments); Yusuke Hiraki, *Japan: Patents-Infringement-Experimental Use Exempted for Clinical Trials*, 21 EUR. INTEL. PROP. REV. N140-141 (1999) (discussing the expansive interpretation of the experimental use exception by the Japanese Supreme Court in *Ono Pharmaceutical Co. Ltd. v. Kyoto Pharmaceutical Co. Ltd.*); Mueller, *supra* note 110, at 37-40 (detailing broader experimental use exception in other countries).

113. See *Micro Chems. Ltd. v. Smith Kline & French Inter-Am. Corp.*, [1972] S.C.R. 506, 520 (Can.); *Dableh v. Ontario Hydro*, [1996] 68 C.P.R. (3d) 129, 149 (Can. Fed. Ct. App.) (sustaining an experimental use defense).

voked harmonization as a reason for eliminating the diversity of national laws that exist on business method patents and the experimental use exception to infringement.¹¹⁴ Such calls for squelching should be tempered with a greater appreciation of the costs of uniformity, particularly the constraint that uniformity imposes on experimentation with cutting-edge legal innovations. In addition to that shift in perspective, two more concrete proposals would be helpful in protecting jurisdictional experimentation and innovation. First, TRIPS should be interpreted and applied in a manner that permits flexibility not only where jurisdictions may have differing tastes and cultures, but also where jurisdictions appear to be engaging in experimentation to improve patent law. Second, further steps at “harmonization” should preserve a certain amount of diversity.

A. Interpreting TRIPS

As previously discussed, the structure and negotiating history of TRIPS show the treaty to be more concerned with imposing certain minimum standards on developing nations, and less with harmonizing the patent law of developed nations. Since developed nations are likely to be good innovators in patent law, TRIPS itself may not pose much threat to ongoing experimentation in patent law provided that the treaty is interpreted as imposing few constraints on the ability of developed countries to maintain diverse laws. But the treaty has not always been viewed in this light.

Consider, for example, the Federal Circuit's opinion in *Rotec Industries v. Mitsubishi Corp.*,¹¹⁵ which is, at once, a great and terrible decision. The *Rotec* litigation concerned whether an offer that the common law of

114. See, e.g., Donna M. Gitter, *International Conflicts Over Patenting Human DNA Sequences in the United States and the European Union: An Argument for Compulsory Licensing and a Fair-Use Exemption*, 76 N.Y.U. L. REV. 1623, 1691 (2001) (concluding that the U.S. should adopt an experimental use exception to infringement because, among other reasons, “this proposal would effectively harmonize U.S. and E.U. law [and thereby] promot[e] harmonious international relations”); John R. Thomas, *The Patenting of the Liberal Professions*, 40 B.C. L. REV. 1139, 1178-85 (1999) (arguing that the United States should curb business method patents by requiring patents to have “industrial applicability” because, among other reasons, adopting such a requirement “would move the United States further in the direction of global patent harmonization”); Brian P. Biddinger, Note, *Limiting The Business Method Patent: A Comparison and Proposed Alignment of European, Japanese and United States Patent Law*, 69 FORDHAM L. REV. 2523, 2553 (2001) (advocating a requirement for U.S. patents to evince a “technological contribution” because the change “would temper the rapid exploitation of business method patents in the United States while harmonizing the protection available internationally”).

115. *Rotec Indus. v. Mitsubishi Corp.*, 215 F.3d 1246 (Fed. Cir. 2000).

contract would not recognize as an offer for sale should nonetheless be considered an offer for sale for purposes of determining a party's infringement liability. As the court noted, pre-TRIPS U.S. law imposed infringement liability where the invention was sold, but not where it was only offered for sale.¹¹⁶ In one of the few instances where it required a change in U.S. law, TRIPS mandated that all signatory nations make "offering [patented inventions] for sale" an act of infringement.¹¹⁷ The United States amended its infringement statute to comply with that obligation, and the *Rotec* court confronted the extent of infringement liability under that TRIPS-mandated amendment. In at least one other nation—the United Kingdom (U.K.)—an "offer for sale" was defined more broadly (e.g., to include "mere advertising activities") for purposes of patent infringement than for the common law of contracts.

The *Rotec* court began its analysis by stating that "we must recognize one of the [TRIPS] agreements' declared purposes: harmonizing worldwide patent law."¹¹⁸ This is a dangerous and inaccurate assumption. It is a dangerous view because, if it were to be applied to eliminate the diversity of law existing amongst highly developed nations like the United States and the U.K., it could significantly curtail experimentation and innovation in the field. But it is also not an accurate view of TRIPS. TRIPS nowhere states that it is trying to harmonize worldwide patent law. True, it is a step toward harmonization, but only a limited one. The negotiation history of TRIPS demonstrates that the agreement was primarily to address the problem of externalities associated with the divergence in intellectual property law between developed and developing nations. The differences in patent law that exist among developed nations, like the U.K. and the United States, are unlikely to be explained by externalities. Indeed, in the specific case of the U.K. and United States, both nations are pioneers of patent law with long, historical commitments to their patent systems; neither seems to be free-riding off the other's patent system.

But let us assume for the moment that harmonization of world patent law is generally a desirable policy. How then should the issue in *Rotec* be resolved? If diversity of patent law serves primarily or exclusively to adjust patent law to differing cultures and tastes, then the issue in *Rotec* would seem an easy case for harmony. The United States and the U.K. are about as close in law and culture as two nations are likely to be. Indeed, the very issue in *Rotec* involves the relationship of patent law to the com-

116. *Id.* at 1249.

117. TRIPS Agreement, *supra* note 4, art. 28.

118. *Rotec*, 215 F.3d at 1253.

mon law of contracts, two areas in which U.S. law grew out of early English precedents. But if the value of experiment and innovation is recognized, the case looks much different. The United States and the U.K. are two of only a handful of highly-developed nations with a long experience in patent law. They are good potential experimenters in patent law, and thus diversity between the two has value.

Now here is why *Rotec* is a great decision: After looking to U.K. law, the Federal Circuit nonetheless allowed U.S. law to diverge from that of the U.K. Under U.K. law, “the common law of contract does not limit the meaning of ‘offer for sale’ in the context of patent infringement.”¹¹⁹ After *Rotec*, the common law does limit the same phrase for purposes of U.S. patent infringement law. And so *Rotec* is a good decision—in terms of preserving diversity—so long as courts follow what the court *did* and not what it *said*.

The legislative history of section 287(c) provides another example where the ability of developed countries to maintain diverse laws was threatened by an overly aggressive interpretation of TRIPS. In one of the few exceptions to the general TRIPS requirement that member countries grant patents in all fields of technology, Article 27.3 of the Agreement allows members to exclude from patentability “diagnostic, therapeutic and surgical methods for the treatment of humans or animals.”¹²⁰ The United States has never taken advantage of this exception but, after one particular patent on a surgical technique triggered extensive public debate on the subject,¹²¹ Congress considered legislation, which would ultimately become section 287(c), making surgical patents unenforceable against doctors and other medical practitioners. In opposing the legislation, the office of the U.S. Trade Representative (USTR) argued that the proposed change would violate TRIPS:

Although TRIPS Article 27:3 permits Members to exclude diagnostic, therapeutic and surgical techniques from patentability, we believe that if a member makes patents available for this field of

119. *Id.*

120. TRIPS Agreement, *supra* note 4, art. 27.3(c).

121. The patent was “Method of Making Self-Sealing Episcleral Incision,” U.S. Pat. No. 5,080,111 (issued Jan.14, 1992). The patentee, Dr. Samuel Pallin, brought an infringement action that survived a motion for summary judgment, *Pallin v. Singer*, 36 U.S.P.Q.2d 1050 (D. Vt. 1995), though ultimately the parties stipulated to the patent’s invalidity due to prior art uses of the claimed technique in *Pallin v. Singer*, Consent Order, Mar. 28, 1996 (D. Vt. 1996), reported at 1996 WL 274407. For a good overview of the debate sparked by the Dr. Pallin’s case, see William D. Noonan, *Patenting Medical and Surgical Procedures*, 77 J. PAT. & TRADEMARK OFF. SOC’Y 651 (1995).

technology, a Member must accord the full rights required under the TRIPS Agreement. Article 27:1 requires that patent rights be enjoyable without discrimination as to the field of technology. Those rights are specified in Article 28 and include the right to prevent third parties from the act of using a patented process.¹²²

While the USTR's interpretation of TRIPS is quite plausible, it would limit legal diversity in the area. Under the USTR view, TRIPS signatories are limited to two polar choices: grant no surgical patents, or grant surgical patents with the full panoply of legal rights afforded other patents. A third alternative—surgical patents with a different set of rights—would not be possible.

As Congress ultimately enacted section 287(c), it seems to have rejected the USTR's interpretation.¹²³ Rejecting that interpretation was a positive development, for even those who might question the particular policy pursued in section 287(c) (including this author) should recognize that the USTR's interpretation restrained legal diversity without advancing the goals of the TRIPS agreement. TRIPS, after all, permits nations to eliminate surgical patents entirely. Interpreting TRIPS to permit just the extremes (full patenting or no patenting) would not address any externality problem nor advance in any significant manner the other plausible policy goals associated with harmonization. While opposition to section 287(c) is understandable on the merits of the policy being pursued in the statute, government officials and other policymakers should balk at advancing interpretations of TRIPS that undervalue legal diversity.

B. Beyond TRIPS

Patent practitioners and policymakers are already looking beyond TRIPS to the next stage of international harmonization. As demonstrated by the statements of former PTO Commissioner Dickinson set forth at the beginning of this article,¹²⁴ one great hope for this next stage is to reduce the administrative costs for obtaining worldwide patent protection. That is a worthy goal, but it does not necessarily require creation of a single pat-

122. Letter from Jennifer Hillman, General Counsel, Office of the U.S. Trade Representative, to Senator Orrin Hatch, *reprinted in* 142 CONG. REC. S11,843 (Sept. 30, 1996); *see also* Cynthia Ho, *Patents, Patients, and Public Policy: An Incomplete Intersection at 35 U.S.C. § 287(c)*, 33 U.C. DAVIS L. REV. 601, 672 (2000) (arguing that section 287(c) may harm U.S. interest in promoting TRIPS because “[o]ther nations may be less likely to uphold the TRIPS provisions if they perceive that the United States, a major proponent of the TRIPS agreement, ignores its provisions”).

123. This, of course, assumes that Congress was taking its obligations under the TRIPS agreement seriously.

124. *See supra* note 2 and accompanying text.

ent office with worldwide jurisdiction. Diverse, competing offices would be better.

The concept of competing patent offices may sound new, but it is in fact already a reality, albeit to a very limited extent. The Paris Convention allows the patent offices of each member country to establish a worldwide priority date; patent offices may thus compete to attract filings intended to establish priority dates.¹²⁵ So too in Europe, national patent offices and the EPO have overlapping jurisdiction, and inventors are free to choose the most efficient examination system. Of course, the national offices are at a disadvantage because their patents cannot extend throughout Europe. But in some circumstances (e.g., where a particular technology is uniquely located in one nation), competition is possible and seems to be occurring.¹²⁶

A more complete vision of competing patent offices can be found in the Patent Cooperation Treaty (“PCT”).¹²⁷ While currently cumbersome and flawed, the PCT does create a system whereby certain functions incident to prosecution are afforded worldwide effect. For example, the PCT standardizes the form and content of applications by barring nations from imposing requirements “different from or additional to” those provided by the PCT and its regulations.¹²⁸ The PCT also mandates a search of prior art by an international searching authority, and that search is used by the patent offices in every nation where the applicant seeks rights. In many jurisdictions, applicants can even choose between international searching authorities. For example, applicants filing in the United States are permitted to select either the PTO or the EPO.¹²⁹ The PCT also authorizes a non-binding preliminary examination of the application, and once again applicants may be granted a choice in selecting an examination authority. U.S. applicants, for example, can choose the EPO provided they selected that agency as their international searching authority.¹³⁰

125. See discussion of Monaco’s efforts to attract patent application filings, *supra* Part II.A.1.

126. For example, in evaluating its own performance in its annual report, the U.K. Patent Office compares the number of its filings against the number received by the EPO. See, e.g., THE PATENT OFFICE ANNUAL REPORT AND ACCOUNTS 2000-2001, at 19 (2001), available at <http://www.patent.gov.uk/about/reports/anrep2001/chapter7.pdf>.

127. Patent Cooperation Treaty, June 19, 1970, 28 U.S.T. 7645, 1160 U.N.T.S. 231, available at <http://www.wipo.int/pct/en/index.html> [hereinafter PCT].

128. PCT, *supra* note 127 art. 27.1.

129. See UNITED STATES PATENT & TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE § 1840.01 (7th ed. 1999) [hereinafter MPEP].

130. MPEP, *supra* note 129, § 1865; see also PCT, *supra* note 127, art. 32.2 (authorizing each patent office receiving PCT applications to designate one or more authorities for conducting international preliminary examinations).

While the PCT has many limitations, two are particularly significant. First, the rules promulgated under the PCT limit inventors to filing in the receiving office of their home country or the International Bureau of the World Intellectual Property Association.¹³¹ This limitation curtails the competition for filings that might otherwise develop between PCT offices. Second, and perhaps more obviously, the PCT gives worldwide effect to only a limited set of functions—establishing requirements for application form and content, receiving the application, and conducting a prior art search.¹³² All other functions incident to examination must be repeated in each country where the inventor seeks rights, and the PCT-authorized preliminary examination need not be afforded any deference by the national examining authority.

The PCT system could be improved if (1) each applicant could choose among a full range of examination authorities, and (2) all functions incident to examination were given worldwide effect. The result would be that the EPO could issue to Americans patents valid in the U.S. (and everywhere else), just as the U.S. PTO could issue to Europeans patents for all the European countries (and everywhere else).

This proposal may seem radical at first because it would allow a non-U.S. entity to issue U.S. patents. But careful analysis reveals that it is not so troubling. The real value of the patent document issued by the PTO—indeed, the real legal effect of that document—is merely a presumption that the PTO’s analysis of the applicant’s rights is accurate.¹³³ It is a technological audit to which courts afford some measure of deference.¹³⁴ There is no necessary reason that such a presumption cannot be afforded to a determination conducted by an entity not part of our nation’s government, provided that the judgments of that entity demonstrate that respect is due. Nor is it necessarily the case that patent applicants would rush to file

131. See PCT, *supra* note 127, Rule 19.1, available at http://www.wipo.int/pct/en/texts/rules/r19.htm#_19; see also MPEP, *supra* note 129, § 1801 (noting that U.S. residents and citizens can file only at the PTO or at the International Bureau). Unfortunately, the rule is also entrenched; each contracting state has an effective veto over any change. See PCT, *supra* note 127, art. 58(3)(a). Contracting states with a large patent offices may resist changes that would increase competition.

132. See PCT, *supra* note 127, art. 27.1.

133. See 35 U.S.C. 282 (1994).

134. Even today, this technology audit is conducted by comparing the alleged invention against a largely global standard of prior art. Thus, each patent office conducts a search of patents and printed publications issued anywhere in the world. The few categories of “country-specific” prior art—e.g., the U.S. category of prior art “known or used by others in this country”—have a negligible effect on patent office practice. 35 U.S.C. §102(a) (1994).

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with the most lax examining office, for a patent from such an office might be worth much less than one from an office with more stringent standards. Indeed, the dynamic might be similar to that in educational market, where the value of reputation drives students to seek degrees from most demanding institutions.

Once we overcome the conceptual hurdle of permitting a non-U.S. entity to issue patents valid within the U.S. (and overcoming that hurdle is essential for any globalized examination system), then there is no convincing reason why only a *single* entity must be vested with that power. And having more than one preserves diversity of practice, fostering competition and innovation.

X. CONCLUSION

The impulse to harmonize worldwide patent law is understandable. The pre-TRIPS variation of substantive law allowed nations with weak patent systems to free-ride on the positive externalities created by stronger systems. Even after TRIPS, the fragmented system of redundant patent examinations is almost certainly not optimal. Since the middle of the fifteenth century, patent law has been an evolving area. The need for continued reform and innovation today is no less pressing than in other eras, and one component in that continuing development will undoubtedly be further integration of the global patent system.

But in reforming current law, we should resist the Sirens' song of complete uniformity. A consolidation of existing patent systems into a single monolith would impoverish the field; it would be mass extinction of legal species. Diversity has its own worth; it permits competition and breeds innovation. These virtues should be evident to the patent community, for they are dear not only to the goals of the patent law, but also to its history. Patent law of the twenty-first century would be enriched if national and international policymakers learn to balance the values of harmony with those of cacophony.