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The TRIPS Component of the GATT's Uruguay Round: Competitive Prospects for Intellectual Property Owners in an Integrated World Market†

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I. EVOLUTION OF THE TRIPS NEGOTIATIONS

A. Logic of a Trade-Based Initiative

Three propositions underlie the developed countries' drive for strengthened intellectual property rights within the framework of multilateral trade negotiations, known as the Uruguay Round, to revise the General Agreement on Tariffs and Trade ("GATT").

1. Strong intellectual property rights exert an unreservedly positive influence on developed free-market economies;
2. Strong intellectual property rights benefit all countries regardless of their present stage of development;
3. The acquisition of non-indigenous technologies by developing countries other than by imports or license usually constitutes an illicit economic loss to the technology exporting countries.

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The first two propositions are counter-intuitive and neither historical experience nor the literature supports them. The social costs and relative efficiencies of intellectual property regimes remain the subject of continuing debate within the industrialized countries even today, and some conservative economists still maintain that a products market unfettered by intellectual property rights would attain greater efficiency than at present. On the whole, a consensus probably exists that industrialized societies are better off with established intellectual property regimes than without them. But there is no consensus concerning the levels of efficiency achieved by any particular regime, and considerable evidence suggests that all extant regimes yield serious inefficiencies under some circumstances. Opinions about the proper balance between the incentives of protection and the benefits of competition vary from country to country and from epoch to epoch within particular countries, and variations in attitude are especially prominent when shifts

exporters without facing any of the risks"; and characterizing state-sanctioned piracy as a de facto producer subsidy). See also J.H. MacLaughlin et al., The Economic Significance of Piracy, in INTELLECTUAL PROPERTY RIGHTS: GLOBAL CONSENSUS, GLOBAL CONFLICT (R. Michael Gadbaw & Timothy J. Richards eds., 1988).

5. See, e.g., JUDITH C. CHIN & GENE M. GROSSMAN, INTELLECTUAL PROPERTY RIGHTS AND NORTH-SOUTH TRADE 105-06 (National Bureau of Economic Research Working Paper No. 1490, 1990); Carlos Alberto Primo Braga, Guidance from Economic Theory, in STRENGTHENING PROTECTION OF INTELLECTUAL PROPERTY IN DEVELOPING COUNTRIES—A SURVEY OF THE LITERATURE 17, 32 (Wolfgang E. Siebeck ed., 1990) [hereinafter STRENGTHENING INTELLECTUAL PROPERTY] ("Overall, economic theory has raised more questions about welfare implications of intellectual property than it has answered."); Carlos Alberto Primo Braga, The Developing Country Case for and Against Intellectual Property Protection, in STRENGTHENING INTELLECTUAL PROPERTY, supra, at 69, 80-81 (concluding that "the protection of intellectual property rights is considered by most authorities to be neither necessary nor sufficient for strong technological activity")..


in the business cycle occur.\(^7\)

As regards the third proposition, that gains from unlicensed uses of foreign technologies in developing countries characteristically represent illicit losses to entrepreneurs in developed countries, this residual mercantilist attitude conflicts with the underlying competitive ethos from which intellectual property rights derogate and with the territorial nature of these derogations.\(^8\) Basic norms of free competition established in the nineteenth century often induced territorial legislators to provide relatively weak forms of intellectual property protection; the standards of protection currently prevailing in developing countries often resemble those applied in the developed world not too long ago.\(^9\) Weak intellectual property laws ensure access to markets for second comers who provide cheaper and better products through imitation and incremental innovation.

\(^7\) See, e.g., Edwin Mansfield, Unauthorized Use of Intellectual Property: Effects on Investment, Technology Transfer, and Innovation, in GLOBAL DIMENSIONS OF INTELLECTUAL PROPERTY, supra note 3, at 107-45; Richard C. Levin et al., Appropriating the Returns from Industrial Research and Development, 3 BROOKINGS PAPERS ON ECON. ACTIVITY 783, 784-88 (1987); Hans Ullrich, GATT: Industrial Property Protection, Fair Trade and Development, in GATT OR WIPO? NEW WAYS IN THE INTERNATIONAL PROTECTION OF INTELLECTUAL PROPERTY 127, 138-42 (Friedrich-Karl Beier & Gerhard Schrieker eds., 1989). See also Mark F. Grady & Jay Alexander, Patent Law and Rent Dissipation, 78 VA. L. REV. 305, 308-10 (1992). In the U.S. prior to 1975, the federal appellate courts tended to invalidate most issued patents that reached them on appeal. The invalidation rate before the United States Supreme Court was so high that it prompted one Justice to exclaim that the only valid patent was one that the Court had not laid its hands on. These tendencies led Congress to establish a specialized jurisdiction for patent appeals, known as the United States Court of Appeals for the Federal Circuit, which took office in 1982. See, e.g., David Silverstein, Patents, Science, and Innovation: Historical Linkages and Implications for Global Technological Competitiveness, 17 Rutgers Computer & Tech. L.J. 261, 268-70, 307-12 (1991).


Innovators who fail to qualify for protection under these laws can rely only on such factors as lead time, reputation for quality, and continuing technical improvements to maintain their foothold in the market.

Undermining this classical nineteenth century outlook are two recent developments that lead directly to the inclusion of international intellectual property issues within the Uruguay Round of multilateral trade negotiations. First, the rise of information-based technologies altered the nature of competition and disrupted the equilibrium that had resulted from more traditional comparative advantages. Because such technologies are inherently vulnerable to rapid appropriation by free-riders who do not share in the costs of research and development, innovators demand both domestic and international measures to protect their investments.\textsuperscript{10} Second, the growing capacity of manufacturers in developing countries to penetrate distant markets for traditional industrial products has forced the developed countries to rely more heavily on their comparative advantages in the production of intellectual goods than in the past. Market access for developing countries thus became a bargaining chip to be exchanged for greater protection of intellectual goods within a restructured global marketplace.\textsuperscript{11}

These tensions largely account for the developed countries' demands for extraterritorial protection of intellectual property rights, which aim to curb free-riding practices seldom illegal under existing international law, and for unilateral trade sanctions that both the United States and the European Communities have exerted


against countries that tolerate such practices. The paradox posed by these demands and the resistance they elicit has been characterized in the following terms:

On the one hand, the industrialized countries that subscribe to free-market principles at home want to impose a highly regulated market for intellectual goods on the rest of the world, one in which authors and inventors may “reap where they have sown.” On the other hand, the developing countries that restrict free competition at home envision a totally unregulated world market for intellectual goods, one in which “competition is the lifeblood of commerce.”

The resolution of this paradox lies in the gradual integration of international intellectual property law into the larger framework of international economic law. This project, however, requires a negotiated balancing of private and public interests valid for all states active in the international economic system. Since 1986, the developed countries’ drive for high international standards has largely ignored the competitive capabilities of developing countries with respect to intellectual goods. It has also downplayed both the developing countries’ rights to differential and more favorable treatment under existing GATT rules and the willingness of these same countries to address the principle of “adequate and effective protection” of intellectual property rights in a manner consistent with their real economic capabilities.

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At the same time, the logic of multilateral trade negotiations skews the pre-existing North-South conflict over intellectual property rights by introducing the prospects of trade concessions in unrelated fields. Trade negotiations enable developed countries to compensate developing countries for the social costs of an Agreement on Trade-Related Aspects of Intellectual Property Rights ("TRIPS" or "Draft TRIPS Agreement" or "Draft Agreement") by increased market access, notably in agriculture and textiles. Such a "package deal" would presumably suspend unilateral trade sanctions against developing countries in favor of improved dispute-settlement procedures within the larger context of a revised GATT instrument.

B. Scope of the Present Inquiry

This Article does not assess the relative costs and benefits of the Uruguay Round's proposed package deal, which affects many

16. See, e.g., John H. Jackson, GATT and the Future of International Trade Institutions, 18 BROOK. J. INT'L L. 11, 13 (1992) (viewing agriculture and textiles as trade-offs for services and intellectual property rights); UNCTAD Report 1991, supra note 15, at 168-73 (predicting long-term opportunity for developing countries to expand agricultural exports, but noting production lags likely to cause short-term problems); infra text accompanying notes 340-41. Attention must also be paid to the effects of other components of a package deal likely to emerge from the Uruguay Round on the overall prospects of the developing countries. See infra notes 17-18; see generally Symposium, Trade-Related Aspects of Intellectual Property Law (pts. 1 & 2), 22 VAND. J. TRANSNAT'L L. 223, 689 (1989).

17. "It is indeed hard to see why many states should accept new multilateral commitments in this area if they remain vulnerable to unilateral actions." Hartridge & Subramanian, supra note 9, at 909. For a formal commitment to this effect, see Draft Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations, GATT Doc. MTN.TNC/W/FA (Dec. 20, 1991) [submitted by former GATT Director-General Arthur Dunkel and sometimes known as the "Dunkel Draft" but hereinafter cited as Draft Final Act], Agreement On Trade-Related Aspects Of Intellectual Property Rights, Including Trade In Counterfeit Goods (Annex III), preamble and arts. 64, 68-69, 71 [hereinafter Draft TRIPS Agreement]; Draft Final Act, supra, § S, Understanding on Rules and Procedures Governing the Settlement of Disputes under Articles XXII and XXIII of the General Agreement on Tariffs and Trade, arts. 11, 1.2, 21.1, 21.2 [hereinafter Draft Understanding on Disputes]. See also Legal Drafting Group, Review of Individual Texts in the Draft Final Act (Informal Note by the GATT Secretariat, June 24, 1992) (proposing largely technical rectifications of the earlier text). But see infra text accompanying notes 334-41.
different sectors of international trade. Nor does it evaluate the likelihood that the developed countries will in fact provide sufficient concessions to offset any competitive disadvantages that a TRIPS component might entail. Officials on both sides of the Atlantic privately declare that if the enhanced market access already agreed by the negotiators were delivered without more, the developing countries would benefit. Yet, spokesmen for the developing countries claim that the economic benefits so far offered to their countries would not offset the combined social costs of the package deal outlined in the Draft Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations ("Draft Final Act").

On the assumption that the parties will negotiate a package deal in the end, the Draft TRIPS component reviewed in this Article represents a more balanced and positive achievement than appeared likely to emerge from the bombastic rhetoric that accompanied the preliminary negotiations. If the United States has retreated from initial efforts to impose its domestic intellectual property laws on the rest of the world, the developing countries have abandoned radical efforts to cut back on minimum standards of protection that


19. See, e.g., UNCTAD Note 1993, supra note 18, at 4-5 (expressing misgivings); Draft Final Act, supra note 17. For the complexities of the market access negotiations, see COMPLETING THE URUGUAY ROUND, supra note 18.


the international intellectual property system has long accepted.\textsuperscript{22} The strengths of the Draft Agreement as it stands at the time of writing lie in a core set of relatively well-established norms whose past effects are known, while its weakest features consist of some untried, stopgap provisions, a few serious lacunae, and lots of loopholes.\textsuperscript{23}

This Article analyzes main provisions of the Draft Agreement and explores the kind of competitive environment that both developing and developed countries would find themselves operating in should a package deal that included a TRIPS component emerge from the Uruguay Round. Based largely on the findings of a study this investigator prepared for the United Nations Conference on Trade and Development ("UNCTAD"),\textsuperscript{24} the present article suggests that the developing countries would have to work harder to compete generally, and to acquire technological innovation specifically, in a post-TRIPS environment. If, however, entrepreneurs in developing countries successfully emulate the strategies of small-


and medium-sized firms in developed countries, any competitive efforts that secure a foothold in the global market, and any effective transfer of technology achieved in the process, would probably yield greater and more lasting returns than at present.

This Article also considers why neither the developed countries as a group, nor the United States in particular, should expect to reap a painless bonanza from the TRIPS undertaking. Although some developed countries may benefit more than others, all will feel the social costs of strengthened protection for intellectual property rights pinching some sectors of their respective economies. In the worldwide market for intellectual goods likely to evolve from a TRIPS Agreement, moreover, alliances between competitors having common interests will increasingly transcend national boundaries. As the participating countries become more interdependent, national oligopolies will wield less control over future negotiations than they have in the Uruguay Round, and individual states will find it harder to speak with a single pro- or anticompetitive voice.

The TRIPS Agreement could thus give rise to an irreversible, ongoing process of multilateral consultations from which there will be no turning back. If so, single states engaged in this process will progressively forfeit more and more sovereignty over the formulation of domestic intellectual property norms, a result likely to disconcert some of today’s most ardent promoters of a trade-based approach to international intellectual property law.

II. PRIMARY INTELLECTUAL PROPERTY REGIMES: PATENTS, TRADEMARKS, COPYRIGHTS

A. Patents

1. Normative Framework

The failure to revise the Paris Convention for the Protection of Industrial Property (“Paris Convention”) after 1967 largely reflects a conflict between the demands of the developed countries for higher international standards of protection and the developing

25. See infra text accompanying notes 365-71.
26. See infra text accompanying notes 324-41.
countries’ efforts to weaken the norms adopted consensually in previous revisions.27 The Draft TRIPS Agreement resolves this conflict in favor of the developed countries by mandating the extension of patentability to virtually all fields of technology recognized in developed patent systems; by prolonging patent protection for a uniform term of twenty years; and by securing legal recognition of the patentee’s exclusive right to import the relevant products.28 The Draft Agreement further requires member states to protect products obtained directly from a patented process,29 and it makes “patent rights enjoyable without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced.”30 Even those member countries that had not yet adhered to the Paris Convention, notably India, would have to respect its substantive provisions in the future.31

The developing countries’ rights to defer implementation of these provisions vary with the relative economic capacity of the country concerned and with the subject matter at issue. All developing countries obtain a five-year transition period during which they need not conform domestic laws to the proposed international minimum standards. For the least-developed countries (“LDCs”), this blanket exemption lasts ten years and may be extended as circumstances require.32

28. See Draft TRIPS Agreement, supra note 17, arts. 27, 28, 33 & 34.
29. Id. art. 28(1)(b); see also id. art. 34(1) (reversing the burden of proof in actions for the infringement of process patents).
30. Id. art. 27(1).
32. See Draft TRIPS Agreement, supra note 17, arts. 65(1), (2) (allowing developing countries a five-year transitional period in general), 66 (ten-year exemption requiring LDCs to provide only national treatment and MFN treatment and to comply with any WIPO undertakings previously incurred). In appropriate circumstances, LDCs may also
Nevertheless, one year after the Draft TRIPS Agreement takes effect, all participating countries must forego patent regulations that discriminate against foreigners. The Draft Agreement also incorporates a Most-Favored Nation ("MFN") principle for intellectual property rights analogous to the MFN principle that the GATT has always applied to goods. This provision will limit the ability of single countries to cut preferential bilateral deals with other countries unless both sides agree to extend the intellectual property regulations in question to their other trading partners.

Developing countries that did not previously afford patent protection to certain product categories, especially food, chemical, and pharmaceutical products, need not formally change their eligibility requirements for a period of ten years. Whether a "pipeline" clause will nonetheless require some interim protection of patentable pharmaceutical and agricultural products in existence at the time a TRIPS Agreement enters into force remains to be clarified.

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33. Draft TRIPS Agreement, supra note 17, arts. 3-5, 65(2). National treatment is expressly required by Article 3 and tacitly by Article 2, which incorporates national treatment provisions of the Paris and Berne Conventions. See also Thomas Cottier, The Prospects for Intellectual Property in GATT, 28 COMMON Mkt. L. REV. 383, 397-98 (1991) (noting that the "conceptual difference of directly protecting rightholders, not goods, excludes broad reference to Articles I and II of GATT" and concluding that the national treatment clause in Article 3 of the Draft TRIPS Agreement "should produce the same effect as Article 2 of the Paris Convention and Article 3 of the Berne Convention").

34. Draft TRIPS Agreement, supra note 17, art. 4 ("With regard to the protection of intellectual property, any advantage, favour, privilege or immunity granted by a PARTY to the nationals of any other country shall be accorded immediately and unconditionally to the nationals of all other PARTIES."). See also Cottier, supra note 33, at 398-99 (noting that MFN had not previously been applied to international intellectual property relations).

35. See Draft TRIPS Agreement, supra note 17, arts. 65(1), (2), (4).

36. Although the Draft TRIPS Agreement, supra note 17, arts. 70(8), (9), contains such a provision, some commentators suggest that it has not proved politically viable. See, e.g., Reinbothe & Howard, supra note 31, at 160 (suggesting that the present text is
Important as the various transitional measures may be, all developing countries whose existing patent laws fall below the proposed international standards must, sooner or later, prepare to implement the Draft TRIPS Agreement if they intend to participate in the final outcome of the Uruguay Round.\textsuperscript{37} It, therefore, becomes logical to predict all the adverse consequences long associated with the dependent role of the developing countries in the international patent system. These consequences include increased royalty payments to foreign innovators; the corresponding loss of investment opportunities in domestic research and development; higher prices for consumer products subject to monopoly rights; and greater dependence on imports in general. On the bleakest view, a developing country stands to gain only when a foreign invention affords solutions of particular local utility that would not otherwise obtain sufficient investment in research and development.\textsuperscript{38}

These predictions capture only the static dimension of a worldwide economic adjustment that could evolve in far more positive directions. For example, enhanced market access flowing from the Uruguay Round’s Final Act should provide new economic opportunities that compensate for the social costs of particular undertakings. Disregarding trade concessions as such, policymakers should not automatically assume that because stronger patent norms benefit the industrialized countries, they would harm the developing countries to a comparable degree. Some studies have found a correlation even in developing countries between an increase in foreign patent applications and the level of domestic economic develop-

\textsuperscript{37} See Draft Final Act, supra note 17, § A, ¶ 5 (permitting only acceptance of the instruments as a whole).

opment. The actual competitive status of any given developing country in a post-TRIPS universe will depend in part on the level of direct or indirect foreign investment these norms help to foster and on the benefits that improved intellectual property rights may bring to domestic innovators. Net social costs will also depend on the willingness of domestic entrepreneurs generally to adopt strategies practiced by smaller firms in industrialized countries who must routinely compete with better organized, more powerful corporations.

2. A Range of Strategic Responses

Because patents retard imitation but do not eliminate it, competition under stronger patent regimes invites developing countries to adopt legal means of narrowing the scope of foreign patent monopolies and of encouraging local entrepreneurs either to work around the claimed inventions or to develop novel improvements suited to local conditions. In the long term, familiarization with the benefits of the system should stimulate greater investment in domestic research and development and should encourage local companies to develop their own intellectual property.


40. See, e.g., Primo Braga, supra note 38, at 257. See also Maskus, supra note 38, at 165, 168 (economic effects of higher intellectual property protection are subtly linked to market structure and to overall trade and industrial policies, though developing countries start from a disadvantaged position). In general, intellectual property rights constitute but one of many variables that bear on competitive capacity and the transfer of technology. See, e.g., IPRs and FDI, supra note 23, at 3-5; see also Mansfield, supra note 7, at 111-14; John H. Dunning, Toward an Eclectic Theory of International Production: Some Empirical Tests, 11 J. Int'l BUS. STUD. 9 (1980).


While local patent authorities could not just dismiss internationally recognized determinations of patent validity without justification, they are entitled to exercise all of the claims limitations practiced abroad and to know the results of prior invalidation proceedings at the administrative or judicial levels. To this end, Article 29 of the Draft TRIPS Agreement allows administrators to require a prospective patentee "to provide information concerning his corresponding foreign applications and grants." Even though the Paris Convention renders each nation's patent-granting process independent of similar processes elsewhere, nothing prevents developing-country administrators from exercising their own judgment in these matters based on all the available evidence.

The scope of patent protection varies from country to country, and no detailed international minimum standards apply. Formally, attaining the same technical result by essentially the same means should constitute infringement within Article 28 of the Draft Agreement. The level of competition in any given field will nonetheless depend on the range of equivalents extended to cutting-edge patents. Improvements that lie outside the coverage of the initial claims may be independently owned and exploited.

While a patent harmonization treaty could eventually require developed countries to practice a broadened doctrine of equivalents, countries such as Japan and even Germany have traditionally recognized only a narrow range of equivalents in order to stimulate local efforts to work around issued patents. The Draft TRIPS

43. Draft TRIPS Agreement, supra note 17, art. 29(2).
44. See Paris Convention, supra note 27, art. 46.
45. See Draft TRIPS Agreement, supra note 17, art. 28 (Rights Conferred).
47. See, e.g., WEGNER, supra note 23, at 24-26, 192-214.
48. See, e.g., Evenson, supra note 42, at 331-32; Alan S. Guterman, International Intellectual Property: A Summary of Recent Developments and Issues for the Coming Decade, 8 SANTA CLARA COMPUTER & HIGH TECH. L.J. 335, 344-45, 348-49 (1992) (noting that narrow doctrine of equivalents under past Japanese law encouraged local firms to file applications that varied only slightly from the foreign application, which promoted cross-licensing in order to avoid infringement actions). However, national treatment provisions of both the Draft TRIPS Agreement, supra note 17, art. 3, and the Paris Con-
Agreement leaves this topic largely unattended, except for certain limitations on dependent patents in the technical sense. Courts and administrators in developing countries, by strict interpretation of equivalents, can therefore encourage local adaptations and improvements within limits.

Developing countries can also incorporate a broad experimental use exception into their domestic patent laws without violating express provisions of the Draft TRIPS Agreement. The Japanese patent law appears to have favored this exception, which prevents patentees from impeding a certain amount of noncommercial reverse engineering for purposes of advancing scientific research.

Above all, the international patent system continues to mandate disclosure of issued patents, and it also requires explanations of the best mode for practicing an invention known to the inventor at the time of filing. Under the first-to-file system used nearly everywhere except the United States, all patent applications are published after eighteen months, whether or not the patents issue. Moreover, the Draft TRIPS Agreement does not require developing countries to recognize a novelty grace period, as distinct from the priority period required under the Paris Convention. The lack of a grace period enables alert entrepreneurs in countries where no timely application has been filed to exploit technical disclosures published in other countries.

In effect, the disclosure requirements constitute a vehicle for direct acquisition of foreign technological knowledge. Potential competitors in developing countries who monitor information flowing from the international patent system will find it easier to work around or to improve foreign inventions. As the foreign paten-

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49. See Draft TRIPS Agreement, supra note 17, arts. 28, 31(l).
50. See, e.g., Rebecca S. Eisenberg, Patents and the Progress of Science: Exclusive Rights and Experimental Use, 56 U. Chi. L. Rev. 1017 (1989).
52. See Draft TRIPS Agreement, supra note 17, art. 29(l).
53. See, e.g., WEGNER, supra note 23, at 47-50, 258.
54. See Paris Convention, supra note 27, art. 4A(l).
55. See, e.g., WEGNER, supra note 23, at 19-22 (documenting reliance of early Japa-
tees' revenues are eroded by disclosure and by the practice of inventing around claimed discoveries, both consumers and local producers of intermediate goods may benefit. Hence, a leading scholar finds that the "rents to inventors, particularly the present value of rents, are generally only a fraction of the ultimate value of the invention."\(^{56}\)

One problem with the drive for universal standards is that differences between developed patent systems will require compromises likely to prove painful even for certain industrialized countries that are reluctant to change their domestic laws. Current discussions of patent harmonization, if brought within future negotiations envisioned by the TRIPS Agreement,\(^{57}\) could thus induce the United States to adopt the first-to-file system in use everywhere else; to employ a more absolute standard of novelty than its domestic law now requires; and to publish all patent applications after eighteen months whether or not the patents in question actually issue.\(^{58}\) These moves could encourage domestic innovators to rely on trade secret protection more than at present and could also strengthen the position of foreign applicants at a time when the domestic market has become increasingly dependent on foreign technologies.\(^{59}\)

Meanwhile, policymakers in developing countries are rightly

\(^{56}\) Evenson, supra note 42, at 331 (noting that, in most cases, rents are eroded within a few years, in part because the maximum amount accruing depends on the next best alternative technology).

\(^{57}\) See infra text accompanying notes 334-39.

\(^{58}\) See, e.g., Wegner, supra note 23, at 44-84, 257-66 (noting discrimination against foreign patentees in 35 U.S.C. § 104 (1988), which often prevents foreigners from invoking first-to-invent procedure because "an applicant for a patent . . . may not establish a date of invention by reference to knowledge or use [of the invention], or other activity with respect thereto, in a foreign country," except as provided for by priorities under existing international conventions); see also Harold C. Wegner, International Patent Law Developments, 4 FORDHAM INTELL. PROP., MEDIA & ENT. L.J. 329 (1993).

concerned about the foreign patentee’s exclusive right to import patented goods, which has been strengthened by the elimination of local working requirements under the Draft TRIPS Agreement and by tariff reductions also resulting from the Uruguay Round.\textsuperscript{60} Enhanced market access for developing-country exporters must, therefore, be weighed against correspondingly improved prospects for imports of patented goods from developed to developing countries.

Several factors attenuate these concerns. For example, the TRIPS negotiators failed to agree on any international norms governing the principle of exhaustion.\textsuperscript{61} National legislation may, therefore, continue to allow parallel imports of genuine goods, at least to the extent that such imports remain consistent with other provisions of the GATT.\textsuperscript{62} Parallel imports lower prices and encourage foreign patentees to establish themselves locally in order to monitor the market and adjust business strategies to changing conditions.\textsuperscript{63}

To the extent that foreign producers elect to satisfy the market by imports alone, in order to exploit monopolistic pricing and other advantages identified above, their exposure to rent erosion by local entrepreneurs who remain closer to the market increases.\textsuperscript{64} These pressures will mount if authorities in developing countries make use of compulsory licensing provisions, explicitly authorized by the Draft TRIPS Agreement, to combat unreasonably priced imports and other abuses.\textsuperscript{65} Distant production and monopoly pricing also

\textsuperscript{60} See Draft TRIPS Agreement, supra note 17, arts. 27(l), 28(l)(a); IPRs and FDI, supra note 23, at 7, 13.

\textsuperscript{61} See Draft TRIPS Agreement, supra note 17, art. 6.

\textsuperscript{62} A footnote to the Draft TRIPS Agreement, supra note 17, art. 28(l)(a), expressly subordinates the exclusive right to import patented products to Article 6, which exempts the topic of exhaustion from the purview of the TRIPS Agreement. See also Cottier, supra note 33, at 399-400 (citing GATT Articles XXIII(l)(b), XX(d), and XXIV as possible limits on various doctrines of exhaustion).


\textsuperscript{64} See supra note 56 and accompanying text.

\textsuperscript{65} See Draft TRIPS Agreement, supra note 17, arts. 31(b), 40; infra notes 117-35 and accompanying text.
render substitute technology more attractive to local consumers, which opens up additional opportunities for local entrepreneurs who may benefit from lower labor costs as well as from lower costs of less advanced technologies.

In other words, stronger patent laws should give local industries greater incentives to exploit technologies that have already entered the public domain. Most technological innovation remains unpatentable by definition because it fails to take an inventive step beyond the prior art, and this applies to much technological know-how associated with patented inventions or components thereof. Because mature patent systems forbid protection of routine innovation, their stringent substantive requirements indirectly encourage competition across the board while elevating the collective technological culture to its next highest level.66

In the past, developing countries tended to overemphasize efforts to reform the international patent system at the expense of strategies to encourage domestic exploitation of unpatented technologies.67 Changing this emphasis is essential for the future competitive prospects of the developing countries for at least two reasons. First, unpatented technologies often remain eminently suitable for local needs. Second, the Draft TRIPS Agreement has left unpatented applications of today's most advanced scientific know-how particularly vulnerable to third-party appropriation. These matters are more fully explored below.68

Another important consequence of stronger patent laws is that they give proprietors in industrialized countries greater incentives to license patented inventions to entrepreneurs in developing countries. Small- and medium-sized technology exporters appear particularly responsive to the lower transaction costs that proprietary

66. See Draft TRIPS Agreement, supra note 17, art. 27(l) (requiring novelty, nonobviousness, i.e., an inventive step, and industrial application); see also Michael Lehmann, Property and Intellectual Property—Property Rights as Restrictions on Competition in Furtherance of Competition, 20 I.I.C. 1 (1989).


68. See infra text accompanying notes 258-71.
regimes tend to foster. Increased local licensing potentiates access to the latest technologies while increasing the pool of local skills capable of eroding monopoly rents. In certain fields, notably information technologies, licensing may afford the only means of circumventing oligopolistic prices and practices.

Over time, developing-country licensees who exploit their natural advantages, especially low labor costs, could succeed on both domestic and export markets where nonlicensees were unable or unwilling to venture in the past. Conversely, when measures to attract either licensing or direct foreign investment fail, these countries can encourage local firms to enter the market as soon as patents supporting significant imports expire.

3. New Technologies

Special problems arise from the gradual extension of patents to new technologies, especially computer programs and biogenetic engineering, without the emergence of clear international minimum standards. In the United States, for example, the patenting of both computer programs and biogenetic innovation has grown considerably in recent years, whereas the European Community has moved at a slower pace, especially as regards computer programs. The

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69. See, e.g., Farok J. Contractor, Licensing Versus Foreign Direct Investment in U.S. Corporate Strategy: An Analysis of Aggregate U.S. Data, in INTERNATIONAL TECHNOLOGY TRANSFER: CONCEPTS, MEASURES, AND COMPARISONS 277-78, 300, 314 (Nathan Rosenberg & Claudio Frischtak eds., 1985). In this context, local licensing does not always benefit developing countries more than direct foreign investment, especially regarding the goal of lowering consumer prices; some observers treat licensing and direct foreign investment as strategic substitutes. See id. at 314; Mansfield, supra note 7, at 43-45; Rozek, supra note 2, at 27-30. Much also depends on the extent to which the host country can prevent abusive licensing practices without discouraging the transfer of technology. See, e.g., Ullrich, supra note 7, at 136-38; see also infra text accompanying notes 266-71, 367-71.

70. See, e.g., Leaffer, supra note 12, at 283; Rozek, supra note 2, at 27-30.


unsettled legal status of these technologies is reflected in the Draft TRIPS Agreement, whose ambiguities in this regard leave much to the discretion of domestic law.

a. Biotechnology and plant varieties

Although United States law extends patent protection to virtually all forms of biogenetic engineering, including plant and animal varieties,73 the Draft TRIPS Agreement follows the European Patent Convention of 1973, which recognizes the patentability of microbiological processes but not macrobiological processes.74 As a result,


74. See Draft TRIPS Agreement, supra note 17, art. 27(3)(b); Convention on the Grant of European Patents, opened for signature Oct. 5, 1973, 13 I.L.M. 270, art. 53(b) [hereinafter EPC]; see generally GERALD PATerson, THE EUROPEAN PATENT SYSTEM: THE LAW AND PRACTICE OF THE EUROPEAN PATENT CONVENTION 334-42 (1992) (noting that nonpatentable subject matter discussed in EPC art. 53(b) is essentially biological in nature).
adherents to TRIPS must provide patent protection for micro-organisms and for "non-biological and microbiological processes," but not for higher organisms, whether plant or animal, nor for "essentially biological processes for the production of plants or animals." Parties that exclude plants from patent law, however, must protect plant varieties under sui generis laws largely governed by the International Convention for the Protection of New Varieties of Plants ("UPOV Convention").

Because microbiological advances routinely affect changes in the higher plant and animal world, unsound legal distinctions between inventions said to be macro- or microbiological in nature have not always been implemented with consistent or persuasive results. Nor has a firm consensus emerged concerning the application of patent-law mechanics to this field. For example, disagreements exist with regard to the patentability of so-called "products of nature" and of living things in general; to the appropriate criteria for determining novelty and nonobviousness; to the deposit and enablement requirements; and to the proper scope of protection. Harmonization efforts are under way, however, and any

75. Draft TRIPS Agreement, supra note 17, art. 27(3) (exempting mandatory protection for methods of treating humans or animals as well as "plants and animals other than microorganisms, and essentially biological processes for the production of plants or animals," but requiring some protection of plant varieties).


realistic appraisal of long-term prospects must allow for future pressures to adhere to norms affecting biotechnology that subsequently attract a broad consensus.

On the whole, developed countries continue to enjoy unique advantages in biotechnology that often become available to developing countries only as a consequence of stronger patent systems. Some developing countries may find their own competitive status enhanced by the provision of proprietary rights in this field, including plant breeders' rights, and others may not. 80 For example, opinions differ on the extent to which proprietary regimes would themselves contribute to a transfer of productive capacity to suitable developing countries, especially as regards biotechnology-based pharmaceutical products. 81 Improved intellectual property regimes are expected to increase the licensing of biotechnological advances generally, and they would help to ensure that foreign


80. See, e.g., Claudio R. Frischtak, Harmonization Versus Differentiation in Intellectual Property Rights Regimes, in Global Dimensions of Intellectual Property, supra note 3, at 89-106 (noting complexities of Brazilian situation); Stewart, supra note 42, at 310-15. Studies suggest that developing countries are fairly well-positioned to promote biotechnological innovation owing to such factors as climate and geography, which endow them with genetically diverse raw materials on which the developed countries increasingly depend. Other positive factors include the existence of agricultural research institutes in many developing countries and the needs of consumers in these countries for particular agricultural and pharmaceutical products of little current interest to large foreign firms. See, e.g., Straus, supra note 39, at 9-12, 35; Rebecca L. Margulies, Note, Protecting Biodiversity: Recognizing International Intellectual Property Rights in Plant Genetic Resources, 14 Mich. J. Int'l L. 322, 348-49 (1993). A number of Latin American countries have already taken steps to promote research in biotechnology. Given low labor costs, the relatively low capital investment required, and the ease of entering these markets, more developing countries are likely to target biogenetic research in the future, and the enactment or strengthening of intellectual property regimes could further spur these initiatives.

81. For a pessimistic view, see IPRs and FDI, supra note 23, at 28-29. But see supra note 80.
technologies made available locally by any means were up-to-date.\textsuperscript{82} Domestic patenting would also disclose enabling technologies in local languages and promote greater scientific collaboration, while all proprietary regimes could benefit some local innovators and stimulate them to seek transnational enforcement of claims to innovative plant genetics.

On the negative side of the balance, the patenting of biogenetic advances decreases the possibilities of reverse-engineering and could increase the costs of doing business in key sectors of some developing economies, notably agriculture. At the limit, these higher costs could offset trade concessions that result from the Uruguay Round.\textsuperscript{83}

In any event, the present lack of consensus at both national and international levels affords developing countries considerable leeway in adjusting the level of protection for biogenetic innovation to suit their own needs. Determining these needs in light of a nondogmatic quest for competitive strategies to exploit each country’s specific biological and scientific resources remains a difficult task, although it is facilitated by the UPOV option under Article 27(3) of the Draft TRIPS Agreement.\textsuperscript{84} This provision enables member countries to protect plant varieties, both artificial and natural, under sui generis laws rather than patent laws, or even to cumulate protection under both regimes if so desired.\textsuperscript{85}

As revised in 1991, the UPOV Convention contemplates a twenty-year term of protection for new plant varieties, whether of natural or artificial origin, on condition that each such variety should be distinct, uniform and stable.\textsuperscript{86} Because only novelty but

\textsuperscript{82} See, e.g., Margulies, supra note 80, at 347-48; Straus, supra note 39, at 33-34; see also László Kálmán & Mark Dickey, The Role of Plant Breeders’ Rights in the Transfer of Technology—II, in UPOV SEMINAR ON THE NATURE OF AND RATIONALE FOR THE PROTECTION OF PLANT VARIETIES UNDER THE UPOV CONVENTION 101, 106 (1991) [hereinafter UPOV SEMINAR].

\textsuperscript{83} See, e.g., Lesser, supra note 73, at 59-68; Rajaram Dasgupta, Subsidies, Patents and Market Access in Dunkel Draft, ECON. & POL. WKLY. (India), May 1, 1993, at 855-58.

\textsuperscript{84} See supra notes 75-76 and accompanying text.

\textsuperscript{85} See Draft TRIPS Agreement, supra note 17, art. 27(3)(b) (conforming, in this respect, to UPOV Convention as revised in 1991, see supra note 76).

\textsuperscript{86} See UPOV Convention, supra note 76, arts. 5-9, 19, 33 U.S.T. at 2710-13, 2717;
not nonobviousness is required, the UPOV Convention initially provided a narrow scope of protection, which is still reflected in the United States Plant Variety Protection Act of 1970.\textsuperscript{87} Under pressure from industry, however, the latest revision has broadened the scope of protection that UPOV Convention signatories may provide and given it a more patent-like character.\textsuperscript{88}

For example, the breeder’s exclusive rights with respect to propagating material of a protected variety may now include not only commercial production, sale and marketing, but also reproduction, propagation, or conditioning, as well as the export, import or stocking of relevant material for any of these purposes.\textsuperscript{89} The revised UPOV Convention extends breeders’ rights to products made directly from harvested materials in certain circumstances. It also provides a range of equivalents that encompass derived varieties for the first time while recognizing only a narrow exception for farmers who use the products of their own harvests and a broad exception for research purposes.\textsuperscript{90} At the same time, the 1991 amendments extend the field of application to cover the whole plant kingdom, and not just species of interest to single states,\textsuperscript{91} a measure that should prevent the developed countries from excluding tropical and other varieties of particular interest to developing countries.

\textit{see also} André Heitz, \textit{History of the UPOV Convention and the Rationale for Plant Breeders’ Rights}, in \textit{UPOV Seminar}, supra note 82, at 19, 37. The minimum term of protection for trees and vines is 25 years. \textit{See} UPOV Convention, supra note 76, art. 19(2).

87. \textit{See} PVPA, supra note 73, § 2541 (infringement), § 2543 (seed and crop exemption), § 2544 (research exemption).


89. UPOV Convention, supra note 76, art. 14(1)(a).

90. \textit{See} id. arts. 14(2), (3), (5), 15, 16; Harvey, supra note 88, at 44-46. \textit{Cf.} PVPA, supra note 73, §§ 2541, 2543; \textit{cf. also} Asgrow Seed Co. v. Winterboer, 989 F.2d 478 (Fed. Cir. 1993) (denying petition for rehearing in case that broadened farmer’s exception under PVPA, despite strong dissent by Judge Newman), \textit{petition for cert. filed}, 62 U.S.L.W. 3001 (U.S. June 23, 1993). In general, the PVPA is now considerably less protective than the UPOV Convention regime that emerged from the 1991 revision.

91. \textit{See} UPOV Convention, supra note 76, arts. 3(1) (giving old members who adhere to 1991 text five years to protect “all plant genera and species”), 3(2) (requiring new members to protect 15 plant genera or species at the time of adherence to the convention and all genera and species within 10 years thereafter); Harvey, supra note 88, at 46-47.
Some experts believe that greater use of the UPOV Convention framework to stimulate commercial exploitation of botanical resources would give the developing countries unique competitive opportunities.\textsuperscript{92} In any case, besides evaluating the mix of proprietary rights that best suits their individual needs, developing countries interested in promoting biotechnological pursuits need to conserve their natural genetic endowment for future exploitation. Developing countries may also decide to regulate the manner in which foreigners obtain supplies of local germ plasm, with a view to sharing in the proceeds of commercial exploitation.\textsuperscript{93}

Meanwhile, alert entrepreneurs in all countries will find that much biotechnological innovation, especially processes for making end-products, will fail to meet the nonobviousness standard of domestic patent laws.\textsuperscript{94} Such innovation obtains protection in developed countries only as know-how in trade secret law, on a par with much software innovation.\textsuperscript{95} The possibilities for reverse-engineering are then enhanced by the self-reproductive properties characteristic of both natural and genetically refined organisms.\textsuperscript{96}

Moreover, entrepreneurs in one country may sometimes manufacture exportable end-products locally from biotechnological processes when only these processes (but not all the corresponding products) are patented abroad.\textsuperscript{97} Countries adversely affected by


\textsuperscript{93} See, e.g., Margulies, \textit{supra} note 80, at 349, 351-53 (citing authorities). By treating germ plasm like other natural resources, the developing countries could eventually sell exploration rights, or license specific materials for royalties, or even exchange such materials for advanced technologies and technical assistance. In the long term, coordinated conservation efforts could lead to the establishment of international repositories that would levy blanket licensing fees on seed companies and other users of plant material. \textit{Id.}

\textsuperscript{94} See, e.g., Burk, \textit{supra} note 78, at 34-39, 42-58; Richards, \textit{supra} note 78, at 452-62.

\textsuperscript{95} See infra text accompanying notes 260-71 (discussing “The Know-How Gap in TRIPS”).

\textsuperscript{96} See, e.g., Straus, \textit{supra} note 39, at 29.

\textsuperscript{97} See, e.g., Amgen, Inc. v. United States Int’l Trade Comm’n, 902 F.2d 1532 (Fed. Cir. 1990) (allowing importation of foreign end-products made by nonpatented process
such trade will move to close this loophole in due course. Even so, to the extent that developed countries unilaterally broaden the opportunities to patent biogenetic products or processes without negotiating equivalent norms at the international level, firms in developing countries may seek to patent innovations abroad that would not be patentable at home.

b. Information technologies

Although copyright and trade secret laws are the most widely used means to repress the copying of computer programs in both developed and developing countries, the patenting of computer program-related inventions has increased in recent years, especially in the United States and Japan. Opposition to the patenting of computer programs remains strong, however, and complicated judicial tests so far devised to distinguish patentable applications of mathematical algorithms to utilitarian objectives from unpatentable ideas, scientific principles, and mathematical formulas have not earned a scholarly consensus even in the United States. Much uncertainty

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that used patented intermediate product); Burk, supra note 78, at 66-69, 75-76; see also Michael S. Greenfield, Note, Recombinant DNA Technology: A Science Struggling with the Patent Law, 44 STAN. L. REV. 1051 (1992).


100. The United States Patent and Trademark Office currently issues patents for computer program-related inventions that are described either as a series of functional steps carried out by a computer (i.e., as a process) or as a system capable of performing
also surrounds the scope of protection likely to be afforded program-related inventions owing to serious gaps in the patent authorities' data concerning prior art and to doubts about the appropriate level of nonobviousness in this field.\(^{101}\)

Despite the controversy it continues to spark, the patenting of computer program-related inventions seems likely to gain ground for a number of reasons. Copyright law cannot directly protect program function or basic components of user interfaces, and independent creation affords second comers a perfect defense to a charge of copyright infringement even when courts allow some indirect protection of these elements.\(^{102}\) As explained below, recent
certain functions (i.e., as an apparatus), but not for program code as such. See, e.g., Diamond v. Diehr, 450 U.S. 175 (1981); Arrhythmia Research Technology, Inc. v. Corazonix Corp., 958 F.2d 1053 (Fed. Cir. 1992) (holding that claims to a specified process or apparatus implemented in accordance with a mathematical algorithm will generally satisfy the patent statute); see also OTA REPORT 1992, supra note 98, at 132. Process claims describe functional steps at a fairly high level of abstraction, while apparatus claims describe the means of performing the functions that yield new machines or improvements of unprogrammed machines. In either case, courts treat the subject matter as statutory only if a claimed invention consists of a so-called "nonstatutory mathematical algorithm" as defined in complicated legal tests that aim to exclude scientific principles, abstract ideas, and mathematical formulas or discoveries. See, e.g., In re Grams, 888 F.2d 835 (Fed. Cir. 1989); In re Iwahashi, 888 F.2d 1370 (Fed. Cir. 1989).

If a mathematical algorithm is deemed present, courts use these tests to determine if it has been sufficiently applied to a utilitarian objective, as when a computer is used as part of a process or apparatus for the transformation of a physical substance into a different state. See, e.g., Richard H. Stern, Tales from the Algorithm War: Benson to Iwahashi, It's Deja Vu All Over Again, 18 AIPLA Q.J. 371 (1991); Ronald S. Laurie, Patentability of Computer Programs in the United States, in THE LAW OF INFORMATION TECHNOLOGY IN EUROPE 1992: A COMPARISON WITH THE USA 87-102 (A.P. Meijboom & C. Prins eds., 1991). However, the line between mathematical algorithms and other types of program function is hard to draw and not really consonant with the tenets of computer science, while European courts applying similar legal concepts might reach different and more restrictive results on facts establishing eligibility elsewhere. See, e.g., OTA REPORT 1992, supra note 98, at 133, 136-37; Allen Newell, The Models Are Broken, the Models Are Broken!, 47 U. PITT. L. REV. 1023, 1032-33 (1986); Hanneman, supra note 98, at 84-85.

101. See, e.g., OTA REPORT 1992, supra note 98, at 134-46; Stern, supra note 100, at 390-91.

102. See, e.g., Pamela Samuelson, Computer Programs, User Interfaces, and Section 102(b) of the Copyright Act of 1976: A Critique of Lotus v. Paperback, 55 LAW & CONTEMP. PROBS. 311 (1992); J.H. Reichman, Overlapping Proprietary Rights in University-Generated Research Products: The Case of Computer Programs, 17 COLUM.-VLA
federal appellate decisions in the United States have significantly reduced the range of program elements likely to qualify as copyrightable expression, while still other decisions permit analytical use of functional matter even when it entails the making of intermediate copies.\textsuperscript{103} As the software industry matures, it seems to require greater investment in research and development and a higher level of innovation to penetrate crowded market segments than in the past. These endeavors, together with still riskier applications of artificial intelligence and other products of systems integration, may not attract sufficient venture capital without the incentives that patents provide.\textsuperscript{104}

Against this background, the growing importance of computer program-related patents in some developed countries has spawned fears in developing countries that the TRIPS Agreement might become a trojan horse if it required the latter to recognize such patents against their own interests. Until recently, the software industry even in developed countries has been characterized by incremental innovation, technical dynamism, and rapid product evolution, and these factors encourage second comers in developing countries to acquire market shares by reimplementing known solutions with local variants or by adapting and improving known techniques to local conditions.\textsuperscript{105} Patents, in contrast, could impede both independent redevelopment of functional equivalents and reverse engineering, while enhancing the market power of large firms whose cross-licensing agreements help to erect barriers to entry that

\textsuperscript{103} See infra notes 232-37 and accompanying text.

\textsuperscript{104} See, e.g., OTA REPORT 1992, supra note 98, at 136; Laurie, supra note 72, at 121-50.

smaller firms find difficult to overcome. schl Some observers believe that domestic enforcement of foreign program-related patents could so restrict competition as to condemn even developing countries with a foothold in the world market to a chronically dependent role as cheap suppliers of software services and little else. schl

If it is true that the patenting of computer program-related inventions seems ill-suited to the developing countries’ present needs, schl fears that the Draft TRIPS Agreement would require this practice seem exaggerated, at least for the medium term. The Draft Agreement clearly opts for copyright protection of computer programs as literary works, and it requires that ancillary relief in trade secret law be made available, in the manner explained below. schl Because the TRIPS provisions do nonetheless prohibit field-specific exclusions of patentable subject matter, the most one can say is that the domestic patent laws must recognize some program-related inventions if only because their inventors could reimplement them in hardware. schl

Beyond formal recognition of marginal inventions, however, legal barriers to patentability that are well established in the United

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107. See, e.g., Gopinath & Ravishankar, supra note 105, at 15.
108. Favorable prospects for some developing countries in the software sector arise from relatively low barriers to entry, low labor costs, and a fairly adequate supply of basic programming skills. As more developing countries digitalize their commercial and industrial sectors generally, market niches open up for local firms capable of supplying software solutions suited to local needs, and this experience can generate export opportunities over time. On the negative side, computer technology has advanced so rapidly that developing countries not in the market may find it increasingly difficult to catch up, while even those in the market are handicapped by the lack of infrastructure and by a shortage of high-level design skills and tools. See generally Schware, supra note 105, at 143-44, 151-52. The high prices that distant suppliers charge for computer programs sold to developing countries further retard efforts to close the technological gap and inspire large-scale copying in these countries. Because copying adversely affects local suppliers trying to maintain a foothold in the market, governments must coordinate their intellectual property strategies with a complex array of policies needed to stimulate activity in this sector. See id.; Gopinath & Ravishankar, supra note 105, at 12, 16-17. See also MEHEROO JUSSAWALLA, THE ECONOMICS OF INTELLIGENT PROPERTY IN A WORLD WITHOUT FRONTIERS: A STUDY OF COMPUTER SOFTWARE 89-102 (1992).
110. See Draft TRIPS Agreement, supra note 17, art. 27(1); OTA REPORT 1992, supra note 98, at 134-35, 137.
States and the European Community would, if broadly construed, authorize the patent authorities in developing countries to reject the bulk of all program-related patent applications on subject-matter grounds alone. The difficulties of satisfying the novelty and nonobviousness criteria and the uncertain scope of protection that attends issued patents in this field could further enable courts or administrators in any jurisdiction to restrict the patenting of computer program-related inventions to tolerable levels. Given a lack of consensus at the international level, in other words, developing countries appear free to emulate the most restrictive practices recognized by developed legal systems without fear that a GATT panel could challenge the consistency of their actions with the letter of the TRIPS Agreement.

Perhaps the most accurate conclusion is that the Draft TRIPS Agreement leaves both developed and developing countries free to determine the level of protection to be afforded program-related inventions within their respective jurisdictions but not free to impose their individual decisions on other member countries. Developed countries that allow extensive patenting of computer programs could thus exclude infringing imports from developing countries. But the former could not prevent firms in developing countries from ignoring these same patents at home or from exporting competing products that did not violate copyright, trademark and trade secret laws to third-country markets where such patents were not given effect. Whether, over time, large multinational firms armed with patented information technologies and cross-licensing arrangements will continue to dominate the world market for computer programs would depend on many factors, including the ability of competitors from developing countries to exploit current weaknesses in the copyright approach and to respond with lower priced alternative technologies suited to local needs. By the same token, developing-country entrepreneurs that achieve major breakthroughs in software development at home need not hesitate to patent their

111. See supra note 100 and accompanying text.
112. See, e.g., OTA REPORT 1992, supra note 98, at 135, 150-51; Hanneman, supra note 98, at 84-85.
achievements abroad wherever program-related patents are issued.

In the long run, pressures to integrate program-related inventions more fully into the international intellectual property system could prevail unless compromise efforts to develop an appropriate sui generis regime bear fruit. Entrepreneurs in developing countries may, therefore, consider forging alliances with trade groups in the developed countries that oppose excessive protection of computer programs.\textsuperscript{113} These groups should also remain open to sui generis proposals that may one day afford a better balance between private and public interests than either copyright or patent laws now provide.\textsuperscript{114}

4. Limits of the Patent Monopoly

Although policymakers should not exaggerate the anti-competitive effects of stronger patent systems in a post-TRIPS environment, different developing countries will experience different degrees of hardship in the short term and all may expect to experience some degree of hardship.\textsuperscript{115} To the extent that foreign inventors do not make patented technology available on reasonable terms and unwholesome economic dependencies actually arise, single developing countries will have to consider measures to restore the competitive balance that are consistent with both the TRIPS Agreement and the Paris Convention.\textsuperscript{116} The safeguards available under the Draft Agreement remain more ample than one might have predicted at the outset of the negotiations.


\textsuperscript{115} See, e.g., Maskus, \textit{supra} note 38, at 167-69.

\textsuperscript{116} See \textit{supra} note 31 and accompanying text.
a. Compulsory licenses for unreasonably priced imports

Article 30 of the Draft TRIPS Agreement declares that states should tolerate only “limited exceptions to the exclusive rights” that Article 28 confers. Article 31 nonetheless contradicts this principle by acknowledging that the domestic laws allow “for other use . . . without the authorisation of the right holder.”117 The Draft TRIPS Agreement then spells out the bases and conditions for governmentally imposed “other use,” and there appears to be considerable leeway for interpretation.

For example, Article 7 of the Draft Agreement suggests that regulatory action might be warranted where the protection and enforcement of intellectual property rights does not “contribute to the promotion of . . . innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users . . . and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.” Similarly, Article 8(1) recognizes the need “to protect public health and nutrition, and to promote the public interest in sectors of vital importance to . . . socio-economic and technological development” through measures consistent with the TRIPS Agreement as a whole. Article 8(2) allows appropriate measures to prevent “abuse of intellectual property rights.”118 Taken together, these articles preserve and expand exceptions that Article 5A of the Paris Convention has long recognized, and they explicitly entitle developing countries to assimilate concerns about economic development into these exceptions.119

Even forfeiture or revocation of the offending patent becomes technically feasible under Article 32 of the Draft Agreement, subject to an opportunity for judicial review.120 Forfeiture, however,

117. See Draft TRIPS Agreement, supra note 17, arts. 28, 30, 31.
118. See id. arts. 7, 8.
119. See Paris Convention, supra note 27, art. 5A; G.H.C. BODENHAUSEN, GUIDE TO THE APPLICATION OF THE PARIS CONVENTION FOR THE PROTECTION OF INDUSTRIAL PROPERTY AS REVISED AT STOCKHOLM IN 1967 67-73 (1968); see also infra text accompanying notes 136-47, 352-56 (discussing relation of these articles to dispute-resolution process).
120. See Draft TRIPS Agreement, supra note 17, art. 32.
remains a drastic remedy that the Paris Convention had already subjected to numerous limitations and conditions. For example, states could not revoke a patent merely because the patentee imported the patented products instead of working the patent locally; nor could states impose forfeiture to rectify "abuse" of the patentee's exclusive rights when a compulsory license would suffice; and a period of compulsory licensing must normally precede even a justifiable action to revoke on grounds of abuse. 121 While forfeiture on other public-interest grounds remains a theoretical possibility, 122 states that resort to this remedy in any but the most exceptional circumstances should expect to elicit protests under the TRIPS dispute settlement framework. 123

The standard form of remedial action remains compulsory licensing, as it was under Article 5A of the Paris Convention, subject to important refinements and limitations that Article 31 of the Draft TRIPS Agreement attempts to introduce. 124 In principle, both the public-interest exception and measures to prevent abuse, respectively stipulated in Articles 8(1) and 8(2) of the Draft Agreement, could justify resort to compulsory licensing. In the past, however, the meaning of "abuse" was the source of considerable controversy. While a few developed countries, notably the United States, limit the concept to anti-competitive practices bordering on antitrust violations, most countries—and a leading commentator—consider the doctrine of abuse applicable if a patentee fails to work the patent locally in due course or "refuses to grant licenses on reasonable terms and thereby hampers industrial development, or does not supply the national market with sufficient quantities of the patented product, or demands excessive prices for such products." 125

The Draft TRIPS Agreement merges this broader concept of abuse with the public-interest exception for purposes of compulsory

121. See Paris Convention, supra note 27, art. 5A(1), (3).
122. Cf. BODENHAUSEN, supra note 119, at 70 (distinguishing measures required by the public interest from measures to prevent abuse and contending that legislation pertaining to the public interest was not subject to Article 5A(3), (4) of the Paris Convention).
123. See infra text accompanying notes 342-64.
124. See Draft TRIPS Agreement, supra note 17, art. 31(a)-(l).
125. BODENHAUSEN, supra note 119, at 71.
licensing under Articles 8(1) and 8(2). However, considerable effort has been made to discredit nonworking of foreign patents locally as a sufficient basis for triggering such licenses. The Draft Agreement also subjects all nonexclusive compulsory licenses sounding in any of the bases established by Article 8 to the conditions of Article 31. This Article normally requires the would-be licensee to seek a negotiated license from the right holder and to pay equitable compensation if these negotiations fail to produce a voluntary license on reasonable terms and conditions, and it also imposes restrictions on the exportation of products resulting from such a license.

Derecognition of the long-standing obligation to work patents locally, which follows from the TRIPS proposal to vindicate the patentee’s exclusive right to import the patented products, may harm the developing countries less than one might suppose at first glance. In the past, resort to compulsory licenses for mere nonworking had been infrequent and seldom successful, and at least one developing-country economist casts doubt on the utility of this device under most circumstances. Leaving aside questions of efficiency, a requirement to produce locally despite the availability of imports on reasonable terms could also conflict with other GATT rules that would apply if TRIPS became fully integrated into a revised GATT instrument. Instead, the Draft TRIPS Agree-

126. See Draft TRIPS Agreement, supra note 17, arts. 8(l) (relating public interest exception to the promotion of “socio-economic and technological development,” which overlaps the broader concept of “abuse”), 31 (conditions of compulsory licenses), 27(l) (providing that “patents shall be available and patent rights enjoyable without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced”).

127. See id. art. 31(b)-(j).

128. See id. art. 28(l)(a); see also id. art. 27(l).


130. See, e.g., Cottier, supra note 33, at 407-08 (citing GATT, supra note 1, arts. XI, XX(d)).
ment allows developing countries directly to address the primary concern underlying the old local-working requirement, namely, monopolistic pricing. To this end, Article 31(b) allows member states to impose nonexclusive compulsory licenses when, despite negotiations with the rights holders, the latter have failed to license the patented technology "on reasonable commercial terms and conditions."  

This "fragile compromise" does limit the availability of lawful compulsory licensing, and it subjects such licenses to equitable compensation and reasonable restrictions on the exportation of the resulting products. Yet, these very limitations confirm the legitimacy of imposing compulsory licenses to rectify economically unreasonable behavior, especially in regard to pricing or harsh contractual conditions. To be sure, excessive reliance on this outcard could elicit claims of impairment and nullification, and resort to compulsory licensing would become counter-productive over time if it unduly discouraged direct investment or other transfers of technology. Nevertheless, the requirement that would-be compulsory licensees negotiate seriously with rights holders to obtain exclusive licenses on reasonable terms will increase the pressure on foreign patentees to deal on reasonable terms and to obviate the conditions that lead governments to seek compulsory licensing in the first instance.

b. Other abuses and the public interest exception

As regards measures to prevent abuse in the narrow sense of the term, Article 31(k) exempts compulsory licenses that correct "anti-competitive practices" from some of the constraints discussed above, including restrictions on exports and the duty to negotiate, provided that a judicial or administrative body has verified that the practice in question is truly anti-competitive. In the United

131. See Subramanian, supra note 5, at 953 (showing that monopolistic pricing is the real evil that compulsory licensing has to address).
132. See Draft TRIPS Agreement, supra note 17, art. 31(b).
133. Cottier, supra note 33, at 408.
134. See Draft TRIPS Agreement, supra note 17, art. 31(a)-(l).
135. See infra notes 339, 355 and accompanying text.
136. See Draft TRIPS Agreement, supra note 17, arts. 8(2), 31(k).
States, such practices border on antitrust violations, and the federal appellate courts almost always apply a rule of reason.137 The European Commission, instead, follows an elaborate set of regulations, built around block exemptions, that limit licensors of both patents and know-how in detailed and specified ways.138

The developing countries remain free to pick and choose among differing regulatory frameworks with a view to proscribing a set of anti-competitive practices that reflects their needs and national development strategies.139 Whether the exemptions of Article 31(k) will apply to any given compulsory license, however, could still depend on unsound distinctions between “public interest” and “abuse,” on the one hand, and “anti-competitive practices,” on the other.140 To complicate matters further, Article 8(2) of the Draft Agreement expressly empowers developing countries to adopt appropriate measures to deal with abusive licensing practices that “adversely affect the international transfer of technology.” Ideally, measures to implement this provision should be negotiated with the industrialized countries, and Article 40 commits both sides to consultations concerning measures that adversely affect the transfer of technology, including abuse of intellectual property rights.141 UNCTAD’s Draft Code of Conduct on the Transfer of Technology (“UNCTAD’s Draft Code”) continues to provide a relevant framework for these negotiations in the eyes of the developing countries.142

139. See Draft TRIPS Agreement, supra note 17, arts. 40(1) (allowing action against licensing practices that unduly restrain competition or impede the transfer and dissemination of technology in domestic markets), 40(2) (specifically authorizing measures to regulate exclusive grantback provisions, conditions preventing challenges to validity, and coercive package licensing); see also id. art. 8(2) authorizing measures to prevent practices that “unreasonably restrain trade or adversely affect the international transfer of technology.”
140. See id. art. 31(k); supra notes 124-25 and accompanying text.
141. See Draft TRIPS Agreement, supra note 17, arts. 8(2), 40.
142. See U.N. Conference on Trade & Dev. (UNCTAD), Draft International Code
Meanwhile, developing countries will want to formulate their own approaches to these problems, and their approaches are likely to deviate from those recognized in developed countries, even if care is taken not to discourage direct investment and the licensing of patented technology. To this end, UNCTAD’s Draft Code also supplies guidelines for the domestic regulation of licensing agreements.143 To the extent that developing countries coordinate their policies concerning abuse and the public interest, it will better enable them to withstand countervailing pressures from the developed countries for more limited restrictions.

Beyond traditional notions of “public interest” and “abuse,” the Draft TRIPS Agreement introduces new and more expansive concepts whose outer limits have yet to be delineated at the international level. As noted, Article 7 stresses the “promotion of technological innovation and . . . the transfer and dissemination of technology . . . in a manner conducive to social and economic welfare.” Article 8(1) expands potential public-interest exceptions to sectors other than public health and nutrition that are “of vital importance to . . . socio-economic and technological development,” and Article 8(2) seeks to vindicate “the international transfer of technology.”144 In addition, Article 66 underscores the least-developed countries’ “need for flexibility to create a viable technological

143. See Draft TOT Code, supra note 142, ch. 4, § B: Report by Experts Addressed to the Secretary-General of UNCTAD, Informal Expert Group Meeting on the Draft International Code of Conduct on the Transfer of Technology (Sept. 3-5, 1990) [hereinafter Experts Report on UNCTAD’s Draft Code of Conduct]; see also BLAKENEY, supra note 129, at 139-50; Yusuf, supra note 14, at 698-701 (discussing terms and conditions of Draft TOT Code from developing countries’ point of view).

144. See Draft TRIPS Agreement, supra note 17, arts. 7, 8(1), (2). For the relation between these articles and the dispute-resolution procedures under the proposed TRIPS regime, see infra text accompanying notes 352-57.
base,” and it must be read in conjunction with the other provisions favoring this group of countries that are discussed later in this study.145

These provisions arm the developing countries with legal bases for maintaining some degree of domestic control over intellectual property policies in a post-TRIPS environment.146 While the meaning of any particular clause must emerge from evolving state practice, taken together they clearly sanction public-interest exceptions of considerable importance to the developing countries while rejecting the more extreme measures these countries proposed during the Paris Revision process.147 State practice within the industrialized countries already allows for considerable leeway in matters of public health and national security,148 and even the United States may fall back upon the public-interest exception to patent rights in implementing a national health scheme. Eventually, specific public-interest safeguards essential to national economic development will have to be worked out on a case-by-case basis, in order to deal with particular instances of technological dependency that are not offset by enhanced market access, and these compromises are likely to give both sides less than they want.

Finally, the administrative costs of implementing the reformed international patent system must also enter into any calculus bearing on the developing countries’ rights to invoke public-interest exceptions. To the extent that these countries become overburdened by administrative costs without receiving the kind of technical cooperation promised under Article 67 of the Draft TRIPS Agreement,149 their case for broadened public-interest exceptions will become compelling, indeed.

B. Trademarks and Geographical Indications

In closed economies, trademarks have long been viewed with

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145. See Draft TRIPS Agreement, supra note 17, art. 66; infra text accompanying notes 333, 343-44.
146. Cf. Zaphiriou, supra note 129, at 885-86.
147. See supra note 22 and accompanying text.
148. See, e.g., Zaphiriou, supra note 129, at 905-14.
149. See Draft TRIPS Agreement, supra note 17, art. 67 (Technical Cooperation); see also Maskus, supra note 38, at 168-69 (stressing that developing countries may find the administrative costs of a TRIPS regime “excessively costly” and a drain on “scarce engineering and entrepreneurial skills”).
suspicion on the grounds that they furthered the interests of foreign firms at the expense of local industry, led to conspicuous consumption of foreign luxury goods, and generally fostered oligopolistic barriers to entry. While there is a grain of truth in each of these assertions, the underlying thesis tends to confuse the problem of abuse with the economic function of marks as such. Stronger international regulation of trademarks and unfair competition in a post-TRIPS universe will require developing countries to reassess the pro-competitive functions of trade marks in open economies while addressing questions of abuse in a more direct fashion. The TRIPS Agreement may also require single industrialized countries, notably the United States, to undertake a more or less painful process of harmonization.

1. Anticounterfeiting Measures and Border Controls

A formal consensus to regulate trademarks and unfair competition has always existed under the Paris Convention, for the reason that, as Ladas observed in 1949, "[i]nternational trade is inconceiv-

150. See, e.g., Blakeney, supra note 129, at 114-19.
151. See, e.g., Daniel M. McClure, Trademarks and Unfair Competition: A Critical History of Legal Thought, 69 TRADEMARK REP. 305, 307, 345 (1979) (finding that advertised marks may insulate products from price competition and that product differentiation can yield nearly insurmountable barriers to entry).
152. Trademarks serve primarily to distinguish the goods or services of single firms from those of other firms. By protecting the signs and symbols used to make these distinctions, trademark law reduces the search costs to consumers, stimulates manufacturers to maintain consistent quality over time, and discourages conduct tending to distort consumer preferences. See, e.g., 2 Stephen P. Ladas, PATENTS, TRADEMARKS AND RELATED RIGHTS: NATIONAL AND INTERNATIONAL PROTECTION 967-68 (1975) (stating that "competition is not possible if the purchasing public cannot distinguish the competing goods and have a chance to choose among them"); William M. Landes & Richard A. Posner, Trademark Law: An Economic Perspective, 30 J.L. & ECON. 265, 297-306 (1987); W.R. Cornish & Jennifer Phillips, The Economic Function of Trade Marks: An Analysis with Special Reference to Developing Countries, 13 I.J.C. 41 (1982). However, trademark laws should not be used to stimulate innovation or to provide incentives for product development as such because these laws lack the limitations and safeguards with which positive intellectual property law balances the long-term public interest against short-term restraints on trade. See, e.g., Ladas, supra, at 967-68; J.H. Reichman, Design Protection and the New Technologies: The United States Experience in a Transnational Perspective, 19 U. Balt. L. Rev. 6, 115-19 (1989-1990) (abridged version reprinted in 30 INDUS. PROP. 220, 257 (pts. 1 & 2) (1991)) (hereinafter Reichman, Designs and New Technologies).
able today without trademarks and their adequate protection.”¹⁵³ In the past, however, lax enforcement prevailed and there was no recourse to dispute-resolution machinery.¹⁵⁴ The Draft TRIPS provisions give pre-existing norms greater specificity by strengthening the protection of service marks, famous marks, and geographical indications of origin, including wines. Other provisions soften the use requirement and eliminate both compulsory licenses and local linkage requirements.¹⁵⁵ Above all, the Draft Agreement subjects the international regime of trademarks and unfair competition to more stringent enforcement measures, including border controls against the import of “counterfeit trademark or pirated copyright goods.”¹⁵⁶

The primary effects of these provisions on the developing countries reside in the potential displacement of industries founded on counterfeiting¹⁵⁷ and in the high cost of legal enforcement measures. To attenuate displacement costs, developing countries need to convert affected industries to the production of clearly marked, substitute goods that establish their own market niche by means of price competition with more costly foreign goods. Governments in the developing countries should generally encourage entrepreneurs to establish their own market identities through appropriate trademarks and to offer products that can be distinguished from those already in the market.¹⁵⁸ Some developing countries may promote

¹⁵⁴. See Paris Convention, supra note 27, arts. 6-10”; Reichman, GATT Connection, supra note 8, at 770-75 (citing authorities).
¹⁵⁵. See Draft TRIPS Agreement, supra note 17, arts. 2 (incorporating Paris Convention, supra note 27, arts. 1-12, 19), 15-21 (trademarks), 22-24 (geographical indications).
¹⁵⁶. See Draft TRIPS Agreement, supra note 17, arts. 41 (general obligations as to the enforcement of intellectual property rights), 46, 51-61, 69 (special requirements related to border control measures and counterfeit goods), 51 n.3 (defining, for purposes of border control measures, “counterfeit trademark or pirated copyright goods”). See also Cottier, supra note 33, at 403-04.
¹⁵⁸. See, e.g., Bojan Pretnar, Industrial Property and Related Trade Policy in Less-
geographical appellations of their own, with a view to enhancing market identity in the future.

The Draft Agreement commits both developed and developing countries to border-control measures to repress imports of counterfeit goods. 159 The imposition of border controls represents one of the most legitimate and promising results of the TRIPS exercise, 160 provided that states implement these measures in a genuinely nondiscriminatory fashion and do not erect disguised barriers to trade. 161 Such measures will succeed only so long as the participating states enforce them vigilantly. To this end, both developed and developing countries will have to curb powerful vested interests, while the developing countries will require the technical cooperation and aid that the Draft TRIPS Agreement provides for purposes of defraying administrative and enforcement burdens. 162 If, instead, the enforcement machinery in any given country breaks down, it will undermine the overall effectiveness of the transnational system envisioned by the Draft Agreement.

The Draft Agreement further envisions future negotiations leading to higher standards of protection for indications of geographical origin. 163 These negotiations could boomerang against the United States, whose practices in this regard fall below the standards pre-

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159. See supra note 156.
160. See, e.g., Hartridge & Subramanian, supra note 9, at 907.
162. See Draft TRIPS Agreement, supra note 17, art. 67; see also Reichman, GATT Connection, supra note 8, at 857-61.
163. See Draft TRIPS Agreement, supra note 17, art. 24(l), (2).
vailing among developed countries.\textsuperscript{164} Sooner or later the United States will have to overcome the resistance of local constituencies and upgrade its laws in this respect. While a trade-based format permits United States negotiators to demand trade concessions in other areas to offset the costs of this adjustment, it also evidences the extent to which this country has become embroiled in a continuing exercise from which it cannot readily pull back.\textsuperscript{165}

2. Licensing and Unfair Competition

Strengthened trademark regimes should encourage both direct investment in developing countries and licensing by foreign producers who seek to monitor quality and to maintain brand names and goodwill in the international market generally.\textsuperscript{166} On the whole, more technology will be licensed to domestic firms when the licensor can both lower transaction costs by recourse to standard intellectual property norms and maintain quality controls through trademark license agreements. Local production under license then reduces the need for imports and helps to build an industrial infrastructure.\textsuperscript{167}

Governments in developing countries need to formulate policies and incentives that encourage foreign firms to allow licensees to adapt more of the licensed products for both domestic and export needs under local trademarks.\textsuperscript{168} The success of Japanese industry in importing foreign technology while developing indigenous marks constitutes an example for other countries to emulate. Countries at lesser stages of development may have less bargaining power when formulating appropriate regulations, however, and may remain more dependent on the introduction of foreign marks.

Although trademarks encourage the production of quality goods, control over quality easily leads to control over price and other

\textsuperscript{164} See, e.g., Kastenmeier & Beier, supra note 161, at 297.
\textsuperscript{165} See infra text accompanying notes 334-41, 368-70.
\textsuperscript{166} See, e.g., IPRs and FDI, supra note 23, at 29.
\textsuperscript{167} See, e.g., Rozek, supra note 2, at 27-31; M. Gabay, The Role of Trademarks in Consumer Protection and Development in Developing Countries, 20 INDUS. PROP. 102, 111-12 (1981).
\textsuperscript{168} Cf. Pretnar, supra note 158.
anticompetitive consequences. Accordingly, developing countries may respond to strengthened trademark regimes in a post-TRIPS universe by replacing obsolete and restrictive trademark laws with up-to-date regulations dealing directly with the abusive licensing practices that flow from market power. While Article 21 of the Draft TRIPS Agreement expressly authorizes parties to "determine conditions on the licensing and assignment of trademarks," the need for adequate licensing regulations affects all subject-matter areas covered by the TRIPS Agreement, including patents, know-how and copyrights.

Certain ancillary issues must also be kept in mind. For example, the TRIPS negotiations did not resolve the problem of parallel imports, nor did they perfect the protection of geographical indications of origin. These lacunae preserve some pre-existing export opportunities pending future negotiations or panel decisions that could limit past practices. At the same time, the decision to incorporate Article 10bis of the Paris Convention into the Draft TRIPS Agreement by reference means that developing countries would have to align domestic unfair competition laws sounding in the deception or confusion rationales with existing international minimum standards. Failure to enforce these laws will become actionable under the dispute-resolving mechanisms of the TRIPS Agreement.

169. See, e.g., Harry L. Shniderman, Trademark Licensing—A Saga of Fantasy and Fact, 14 LAW & CONTEMP. PROBS. 248, 267-68 (1949); McClure, supra note 151, at 346-48 (noting reluctance of U.S. courts to restrain the use of trademarks in preserving monopolistic or oligopolistic market power).

170. See Draft TRIPS Agreement, supra note 17, art. 21; cf. id., art. 8(2) (permitting appropriate measures to restrain abuses or practices that "adversely affect the international transfer of technology"); see also BLAKENEY, supra note 129, at 139-58. To the extent that developing countries formulate appropriate licensing norms in concert, they will find it easier to resist countervailing pressures of either a unilateral or multilateral nature. See infra text accompanying notes 367-71.

171. See Draft TRIPS Agreement, supra note 17, arts. 6 (declining to address issue of exhaustion), 24(l)(committing member states "to enter into negotiations aimed at increasing the protection of individual geographical indications" under Article 23). See also Knaak, supra note 157, at 587-88; Cottier, supra note 33, at 399-400 (raising GATT nullification and impairment issues in regard to the problem of exhaustion).

172. See, e.g., Draft TRIPS Agreement, supra note 17, art. 2(l) (incorporating Paris
C. Copyrights

1. Traditional Literary/Artistic Works and Neighboring Rights
   a. Normative structure

   The Draft TRIPS Agreement mandates compliance with international minimum standards embodied in the Berne Convention for the Protection of Literary and Artistic Works as revised in 1971 ("Berne Convention"). While an exception is made for moral rights under Article 6bis of that Convention, the Draft Agreement treats both computer programs and compilations of data as copyrightable literary works, the consequences of which are discussed below. It also requires parties to provide rental rights to holders of copyrighted computer programs and, to a lesser extent, of cinematographic works as well as to holders of either copyrights or neighboring rights in sound recordings.

   In a new departure, Article 14 of the Draft Agreement mandates recognition of those neighboring rights that had been experimentally protected at the international level only since the signing of the International Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations ("Rome Convention") in 1961. As a result, performers of sound recordings

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174. See Draft TRIPS Agreement, supra note 17, art. 10; see infra text accompanying notes 210-48.

175. See Draft TRIPS Agreement, supra note 17, arts. 10, 11, 14(4). Technically, Article 11 exempts cinematographic works from a de lege rental right if there has not been "widespread copying . . . which is materially impairing the exclusive right of reproduction." This provision, which accommodates U.S. practice, introduces a trade law concept like that of "material injury" into intellectual property law for the first time. See, e.g., Cottier, supra note 33, at 402.

176. See International Convention for the Protection of Performers, Producers of
would enjoy at least the legal possibility of preventing unauthorized fixation, reproduction, and broadcasting of their performances, but not necessarily an exclusive right to these performances; producers of sound recordings would enjoy exclusive reproduction rights, but not necessarily public performance rights, in their sound recordings; and broadcasting organizations would enjoy exclusive rights of fixation, reproduction and rebroadcasting of their programs to the public.\footnote{177}

Article 14(5) extends the minimum term of protection for performers and producers of phonograms from 20 to 50 years and confirms a 20-year term for broadcasts.\footnote{178} However, Article 14(6) softens the impact of the neighboring rights provisions by incorporating “conditions, limitations, exceptions and reservations" already permitted by the Rome Convention. Among other things, this clause enables parties to deny a public performance right to producers and performers of sound recordings; to impose reciprocity, rather than national treatment, on foreign phonograms producers; and to permit both private use and use for the purposes of teaching or scientific research without remuneration.\footnote{179}

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Neighboring rights, or “rights neighboring on copyright,” generally cover “the rights of performing artists in their performances, the rights of producers of phonograms [i.e., sound recordings] in their phonograms, and the rights of broadcasting organisations in their radio and television programs.” World Intellectual Property Organization (WIPO), Basic Notions of Neighboring Rights—International Conventions in the Field of Neighboring Rights, at 2, WIPO Doc. WIPO/CR/GEO/92/3 (Aug. 20, 1992) [hereinafter Basic Notions of Neighboring Rights].

\footnote{177} See Draft TRIPS Agreement, supra note 17, art. 14; Cf. GUIDE TO THE ROME CONVENTION, supra note 176, at 34-38, 43, 46-54. States may, and often do provide similar or greater levels of protection under copyright laws, on condition that they do not in this way adversely affect the level of copyright protection for literary and artistic works that the Berne Convention otherwise requires. See Basic Notions of Neighboring Rights, supra note 176, at 8-9.

\footnote{178} See Draft TRIPS Agreement, supra note 17, art. 14(5).

\footnote{179} See id. art. 14(6); Rome Convention, supra note 176, arts. 12, 15(a), (d), 16; GUIDE TO THE ROME CONVENTION, supra note 176, at 57-58; see also Basic Notions of
Although the United States does not adhere to the Rome Convention and does not recognize the relevant bundle of neighboring rights as such, its copyright law technically overfulfills the minimum requirements of Article 14. However, the rights of United States producers and performers of phonograms to participate fully in revenues generated under neighboring rights regimes abroad has not been established, and efforts to bridge the gap between the United States and the European Community in this regard have so far not borne fruit.

b. Compulsory licenses for educational and scientific works

Although the developed countries have pressed for the inclusion of copyrights and neighboring rights within a TRIPS Agreement, literary and artistic creativity is universally distributed, and situational disadvantages seldom preclude authors in developing countries from entering domestic or foreign markets. Many developing countries participate fully in these markets. Literary and artistic property rights thus become vehicles for the development of autonomous cultural industries everywhere and for the preservation and enhancement of the developing countries' own cultural heritage. Even mandatory recognition of neighboring rights opens certain opportunities for countries whose music, dance and folklore are important components of the national heritage, as attested by the

Neighboring Rights, supra note 176, at 12.

180. See 17 U.S.C. §§ 101, 102(a)(6) (motion pictures and other audiovisual works), 102(a)(7) (sound recordings), 106, (exclusive rights), 107 (fair use), 110 (general immunities and exemptions), 111 (cable television), 114 (limiting exclusive rights in sound recordings), 118-119, 302 (1998); see also supra note 177. Whether U.S. protection of performers' rights satisfies the spirit of these provisions poses a closer question.

181. See, e.g., Oman, supra note 23, at 147.

fact that over half of the parties to the Rome Convention are developing countries. 183

The balance of trade in cultural goods nonetheless favors exports from industrialized countries, and this imbalance could increase under a Draft TRIPS Agreement that seeks to eliminate free-riding in the audio, visual, publishing, and broadcasting sectors. 184 This conclusion follows in part from prior multilateral negotiations to revise the Berne Convention, which established the principle that developing countries could not qualify for differential and more favorable treatment with respect to nonessential works, especially works of mass entertainment that weigh heavily in the balance of trade. 185 Conversely, the revised Berne Convention did enable nationals of developing countries to secure nonexclusive compulsory licenses on favorable terms that grant the rights to translate or otherwise reproduce literary, scientific, and artistic works for teaching, scholarship, or research purposes. 186 The Rome Convention as

183. See Denis de Freitas, The Copyright System: Practice and Problems in Developing Countries 53-55 (1983); Basic Notions of Neighboring Rights, supra note 176, at 14. According to the World Intellectual Property Organization ("WIPO"), neighboring rights are of particular interest to countries endowed with oral traditions and culture, in the representation of which "authors" are usually performers as well. Expressions of folklore that often fail to qualify for copyright protection can thus indirectly obtain protection from rights in performances, fixations, and broadcasts. Similarly, the protection of phonogram producers allows developing countries to establish their own sound-recording industries, which "guarantee[s] ... the dissemination of national culture, both within the country and throughout the world," and also fosters export opportunities. Id. at 14. In WIPO's view, legal safeguards for the interests of performers and producers of phonograms ensure that local productions will "enjoy greater development ... and will suffer less from the competition of unprotected performances of foreign works." Id. at 15. In the same vein, broadcasting organizations in developing countries can benefit from protecting costly programs against unauthorized reproduction, and rebroadcasts of major cultural and sports programs abroad are potential sources of foreign exchange.

184. See, e.g., Rowat, supra note 182, at 419 (showing losses to U.S. exporters to Mexico alone in the range of $75 million for pirated sound recordings, $88 million for pirated motion pictures, and $100 million for computer programs).

185. See, e.g., Reichman, GATT Connection, supra note 8, at 822-27 ("Preferential Treatment under the Copyright Conventions").

186. See Berne Convention, supra note 173, art. 21, app. arts. 1-6 (allowing nonexclusive compulsory licenses for certain educational and scientific purposes, but forbidding exports of works published under these regimes); Sam Ricketson, The Berne Convention for the Protection of Literary and Artistic Works: 1886-1986 632-64
incorporated by reference into the TRIPS Agreement expressly allows the domestic laws of member states to exempt both private use and uses for the purpose of teaching or scientific research.187

Whether the social costs of a TRIPS Agreement will induce the developing countries to make greater use of these concessions than in the past cannot be foretold. In any event, the high cost of imported computer programs, together with a pressing need for developing countries to computerize their industrial activities and to inculcate programming skills and knowledge, make it logical for these countries to demand the inclusion of copyrighted software in the list of works subject to compulsory licenses for educational purposes.188

c. Scope of protection and the public interest

Despite the elaborate web of norms already governing international copyright relations,189 the scope of copyright protection varies from country to country, with little in the way of authoritative legal limitations recognized by international law. For example, there is no international norm governing nonliteral copying, as distinct from literal violations of the exclusive reproduction rights, and state practice varies widely in this regard.190 As explained below, bor-


187. See Rome Convention, supra note 176, art. 15; Draft TRIPS Agreement, supra note 17, art. 14(6).

188. See, e.g., Gopinath & Ravishankar, supra note 105, at 17; O'Neill, supra note 182, at 1159 (stating that most Thais cannot afford the prices of legitimate software products); see also infra text accompanying notes 245-47. To the extent that closer cooperation between developing countries facilitated the negotiation of concessionary educational licenses covering multiple markets for both books and computer programs, it would also press distant suppliers to establish publishing ventures in local markets. This, in turn, could increase employment and further reduce the costs of textbooks and other educational materials, including software.

189. See, e.g., Ricketson, supra note 186, at 206; Reichman, GATT Connection, supra note 8, at 846-48.

190. In part, these variations derive from differences of protective philosophy associated with the utilitarian or incentive rationale of the so-called "copyright" countries and with the authorship rationale of the droit d'auteur countries. See, e.g., Paul Edward Geller, Toward an Overriding Norm in Copyright: Sign Wealth, REVUE INTERNATIONALE DU DROIT D'AUTEUR [R.I.D.A.] (forthcoming 1994). See also Wendy J. Gordon, An Inquiry into the Merits of Copyright: The Challenges of Consistency, Consent, and Encouragement Theory, 41 STAN. L. REV. 1343 (1989); Justin Hughes, The Philosophy
derline subject matter categories, notably functional and factual works, receive "thin" or disfavored treatment even in the United States, a tendency that strengthens the developing countries' ability to compete in the market for electronic information tools.\textsuperscript{191}

Because copyright law regulates the specialized market for literary and artistic works, rather than the general products market, its soft protective modalities differ from the harder monopolies of patents and industrial property rights generally.\textsuperscript{192} Moreover, cultural policy often overrides considerations of economic efficiency based strictly on utilitarian incentives. For example, basic copyright norms recognized by all developed legal systems protect only an author's original expression, not his ideas,\textsuperscript{193} and independent creation constitutes a perfect defense to any charge of copying.\textsuperscript{194} These limitations promote competition by a built-in process of "reverse engineering" that permits third parties freely to use the facts and ideas underlying clusters of related expression.\textsuperscript{195} By dint of their low standards of creativity and originality, moreover, copyright systems allow the market to determine value. Anyone whose literary and artistic creations capture the public's fancy is entitled to a sweepstakes reward that offsets losses from previous essays and attenuates the risk aversion of publishers who invest in dissemination.

Besides exploiting these loopholes, the developing countries may broadly apply certain public-interest exceptions that can help to reduce the overall costs of a TRIPS agreement. For example, the fair use exception disculpates certain unauthorized but socially


\textsuperscript{192} See generally Reichman, Legal Hybrids, supra note 114, at 329-32.

\textsuperscript{193} Accord Draft TRIPS Agreement, supra note 17, art. 9(2) (expressly establishing idea-expression dichotomy).


\textsuperscript{195} See, e.g., Reichman, Electronic Information Tools, supra note 191, at 455-56, 461-62.
beneficial uses either because transaction costs might otherwise stand in the way of negotiated licenses or because the resulting public benefit is thought to outweigh the loss of private gain.\textsuperscript{196} The fair use exception also perfects a broader legislative denial in most countries of any exclusive right to use the copyrighted work, over and above those specific uses protected under the Berne Convention.\textsuperscript{197} The first sale doctrine (that is, the principle of exhaustion), which limits the exclusive distribution right, thus authorizes those who purchase copies of protected works to use and dispose of these copies as they wish, although this doctrine has recently been eroded with respect to rental rights in cinematographic works, phonograms, and computer programs.\textsuperscript{198}

In addition, both domestic and international law recognize numerous exemptions and immunities for educational and social purposes, as well as the imposition of compulsory licenses for recorded musical works and broadcasts.\textsuperscript{199} Still other limitations arise from the state’s general exercise of its police powers and from abuses of the statutory monopoly, whether or not rising to the level of antitrust violations.\textsuperscript{200} In some countries, even the protection of moral rights assumes a public-interest character by enabling state authorities to preserve the integrity of cultural goods beyond the lifetimes of their creators or, in the case of folklore, in the absence


\textsuperscript{197} See, e.g., Frédéric Pollaud-Dulian, Le droit de destination: Le sort des exemplaires in droit d’auteur 279-399 (1989); Ralph S. Brown, Eligibility for Copyright Protection: A Search for Principled Standards, 70 MINN. L. REV. 579, 588-89 (1985).


\textsuperscript{199} See, e.g., 17 U.S.C. §§ 108-120 (1988 & Supp. IV 1992); Berne Convention, supra note 173, art. 2\textsuperscript{nd} (2), (9)(2), 10, 10\textsuperscript{st}, 11\textsuperscript{nd}(2), 13; Ricketson, supra note 186, at 532-42.

\textsuperscript{200} See, e.g., Berne Convention, supra note 173, art. 17; Ricketson, supra note 186, at 542-48; 2 Goldstein, supra note 194, § 9.6.
of specifically identifiable authors.\footnote{201}

It is in this realm of public-interest exceptions that the developing countries may coordinate their policies with a view to enhancing their own competitive prospects both in specific dispute-resolving exercises and in bilateral or multilateral negotiating forums.\footnote{202} For example, the developing countries may formulate common principles governing reprography for personal use, especially research or study, as well as for general educational purposes, in order to limit the future demands of foreign collection societies already operating in this sphere.\footnote{203} Besides adopting immunities and exemptions for face-to-face teaching activities, educational broadcasts, religious functions, and other eleemosynary pursuits favored by developed copyright systems, the developing countries are likely to recognize a public-interest exception for overriding economic development needs.\footnote{204} Authorities in these countries will also monitor the evolution of neighboring rights agreements affecting broadcasts and both producers and performers of phonograms, with a view to adapting these rights to their own needs and to profiting from the disunity that still characterizes this area at the international level.\footnote{205}

\footnote{201. See, e.g., Berne Convention, supra note 173, arts. 6\textsuperscript{th}(2) \& 7\textsuperscript{th}(2), 13, 17; \textsc{Ricketson}, supra note 186, at 313-15, 542-48; \textsc{de Freitas}, supra note 183, at 13.}

\footnote{202. See infra text accompanying notes 334-41, 368-71.}


\footnote{204. \textit{Compare} Draft TRIPS Agreement, supra note 17, art. 13 (limitations and exceptions not to conflict with normal exploitation and not to unreasonably prejudice rights holders' interests) with \textit{id.} art. 7 (stressing mutual advantage of producers and users of technological knowledge, "social and economic welfare and . . . a balance of rights and obligations") and \textit{id.} art. 8(1) (allowing public interest exceptions "in sectors of vital importance to . . . socio-economic and technological development." \textit{See also infra} text accompanying notes 343-62 (dispute-resolution process).}

\footnote{205. \textit{See} Draft TRIPS Agreement, supra note 17, arts. 4(b), (c), 14; Council Directive of 19 November 1992 on Rental Right and Lending Right and on Certain Rights Related to Copyright in the Field of Intellectual Property, 92/100/EEC, O.J. L 346/61 (1992); \textit{see also} Simon, supra note 23, at 278 (noting NAFTA provision of national treatment for phonograms and private copying levies, a condition not guaranteed by TRIPS' incorpora-}
Meanwhile, the process of harmonization that the TRIPS exercise has set in motion will, sooner or later, affect developed countries whose domestic copyright laws lag behind norms widely recognized by mature copyright systems. The United States, in particular, will face continuing pressure to elevate domestic standards pertaining to moral rights and to conform to the retroactivity clause of the Berne Convention. The federal judiciary’s rather free-wheeling approach to fair use may also come under closer scrutiny at the international level, and record companies will be pressed to enhance the rights of performers in their sound recordings. In this as in other respects, the drive for universal standards of copyright protection operates as a two-edged sword whose overall costs must be taken into account.

2. Borderline Subject Matter: Electronic Information Tools

While the extension of copyright protection to borderline technologies, particularly electronic information tools such as computer programs, computerized databases and CD-ROMs, poses serious problems for all intellectual property systems, the risk of overprotection could disproportionately harm the developing countries who are struggling to overcome technological lag. In this connection, Article 10 of the Draft TRIPS Agreement requires all participating countries to protect computer programs in any form “as literary works under the Berne Convention (1971)” and also to protect compilations of data that “constitute intellectual creations.”

These premature attempts to establish high international standards for databases and computer programs could distort interna-

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Footnotes:

206. See, e.g., Berne Convention, supra note 173, art. 6™; Cottier, supra note 33, at 401-02; Oman, supra note 23, at 156.


208. See, e.g., Cottier, supra note 33, at 402; Oman, supra note 23, at 155.

209. See, e.g., Primo Braga, supra note 182, at 51-54 (citing authorities); Stewart, supra note 42, at 313-15.

210. See Draft TRIPS Agreement, supra note 17, art. 10(1), (2).
tional trade, especially if they lead to levels of protection that are inefficient even for developed countries. At present, however, countervailing judicial trends under way in the United States indicate that the full copyright approach institutionalized by the Draft TRIPS Agreement may not give the industrialized countries the level of protection they desire; nor need it unduly impede efforts of the developing countries to compete in these areas. This conclusion is reinforced by the failure of the TRIPS Agreement directly to address the protection of applied scientific know-how, where the true commercial value of electronic information tools usually resides. These themes are more fully investigated below.

a. Factual works, including databases

Although factual works fall within the broad categories of literary works covered by international copyright law, their degree of eligibility and proper scope of protection has become highly controversial. To begin with, compilations of data often lack the stamp of personal intellectual creation that the droit d'auteur countries require, while the United States Supreme Court has recently found that routine compilations of data, such as a telephone directory, may fail to meet the “original work of authorship” standard under the United States Copyright Act of 1976. The Supreme Court denied copyright protection to all literary productions based merely on “sweat of the brow” labor and effort because only “creative authorship” satisfies the Constitutional enabling clause governing copyrights and patents.

211. See, e.g., Mody, supra note 71, at 275; Reichman, GATT Connection, supra note 8, at 875-78.
212. See infra text accompanying notes 232-43.
213. See infra text accompanying notes 256-65.
Even when compilations of data meet the eligibility requirements of domestic copyright laws, the scope of protection in most countries rarely prevents more than slavish imitation of either the compilation as a whole or of a substantial extract based on the same selection and arrangement. This means, as the aforementioned United States Supreme Court’s decision confirms, that the compiler’s copyright cannot prevent third parties from freely exploiting the disparate facts contained in the compilation, although unfair competition law may provide occasional relief.216 To address this problem, the Commission of the European Communities has proposed a sui generis law that would provide noncopyrightable databases with short-term protection against free use of the data they contain, subject to compulsory licenses to maintain a degree of competition.217

These provisory solutions hardly suffice to deal with the more complex problems that digitalization will soon usher in because digitalization changes how authors work, the kinds of works they create, and the way users exploit the end results.218 One immediate challenge for both industrialized and developing countries is how to obtain digitalized information needed for economic development at prices users can afford when electronic information publishers


218. For example, the line between data and the software designed to manipulate it breaks down in applications of artificial intelligence and in object-oriented programming. Hypertext publishing then makes it possible to link related pieces of information in a nonsequential manner, but it poses hard questions about the legal relations between the “authors” of hypertext and the authors of works used in building the system. Mixed-media productions embodied on CD-ROMs break down the subject-matter categories of classical copyright law, which sometimes creates insuperable barriers to licensing. Digitalized libraries open new horizons for scholarship, but they may require “knowbot” tools to search out different sources and to track the relevant rights and obligations. See generally OTA REPORT 1992, supra note 98, at 161-77; Pamela Samuelson, Digital Media and the Changing Face of Intellectual Property Law, 16 RUTGERS COMPUTER & TECH. L.J. 323-40 (1990).
condition access to data on the payment of high subscription fees, user charges, search-time charges, downloading fees and document retrieval fees.\textsuperscript{219} Because subscribers entering any on-line database must log in and out, the proprietors’ physical control over the data may enable them to charge for each and every use of electronically processed information, even though the copyright law itself grants no exclusive right to control either end use in general or the use of disparate facts in particular. Even when dissemination occurs in hard copy form, such as a CD-ROM, digital technology facilitates the control of end use by enabling intermediate providers, such as libraries, to monitor actual usage and by permitting originators who constantly update the data to charge, directly or indirectly, for all uses. Heightened powers of control thus enable publishers to monitor and charge even for uses analogous to those customarily regarded as privileged, such as the making of copies for personal use or for research purposes.\textsuperscript{220}

Besides charging high access fees, publishers of electronic databases have bolstered their market power by imposing harsh conditions in two-way contractual agreements that fall outside of the domestic copyright laws. For example, publishers that supply online information to a network of licensed subscribers may impose a “one at a time” use requirement that forbids networking by multiple users. If networking is allowed, publishers may require the user to obtain a much more expensive license.\textsuperscript{221}

To the extent that electronic information publishers depend on public and private libraries to broaden the diffusion of their products, whether on line or in CD-ROMs, the publishers’ natural monopoly enables them contractually to require librarians to waive privileges that copyright law otherwise affords and to limit users’

\textsuperscript{219} Cf. OTA REPORT 1992, supra note 98, at 176-77.
\textsuperscript{221} See, e.g., OTA REPORT 1992, supra note 98, at 166-67; Reichman, Electronic Information Tools, supra note 191, at 461-67 (“The Public Interest at Odds with the Two-Party Deal”). By supplying on-line information from computerized and constantly updated databases kept on their own premises, publishers avoid the kind of dissemination in hard copies that subjects them to the first sale doctrine (or principle of exhaustion) under copyright laws. See 17 U.S.C. § 109(a) (1988).
access to copyrighted matter beyond what the fair use doctrine would require. For example, a library’s right to make back-up or archival copies, which the copyright law grants to owners of computer programs in most developed countries, does not clearly extend to digital data, and the publisher’s licensing agreement may attempt to abrogate it in any event. Similarly, database publishers in the United States have tried to limit the resource-sharing practices of libraries, which otherwise rest on specific exemptions under domestic copyright law, because the publishers view this practice as one that reduces the market for information. The ability of libraries to enhance the data they receive contractually in order to augment users’ efficiencies also remains unclear in the absence of contractual authorization.

Computerization thus increasingly enables the electronic information publisher to serve as his or her own collection society, subject to no membership controls and no external regulation. Even though subscribers to electronic databases are typically organizations in industrialized countries, such as corporations, libraries, and universities, the compilers’ market power threatens to make the task of updating scientific and technological undertakings too costly even for these organizations. The privatization of information without offsetting compensatory mechanisms could thus further retard technological progress in developing countries.

Policymakers in all countries must, therefore, begin to formulate overriding public-interest limitations on both the legal protection of computerized databases and abusive two-party licensing deals irrespective of the technical norms and limits of copyright law. The lack of effective, as opposed to formal, international standards of protection in this area leaves developing countries considerable leeway in which to foster certain socially beneficial uses of commercialized information at acceptable costs without

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223. See, e.g., OTA REPORT 1992, supra note 98, at 176-79.
unduly discouraging local compilers of tailor-made information products that may be sold to both domestic and foreign users. While toleration of wholesale duplication of data by free-riding local publishers could violate the Draft TRIPS Agreement, the developing countries may have to take the lead in regulating providers of databases and other electronic information tools in order to promote the "balance of rights and obligations" required by Article 7 of that same Agreement.\textsuperscript{225}

b. Functional works, including computer programs

In assessing the potential impact of a TRIPS Agreement on the legal protection of computer programs, policymakers must once again bear the limits of the copyright paradigm firmly in mind. As previously observed, copyright law prohibits only the copying of an author's creative expression, but not the use of underlying ideas or of other functionally determined matter, and independent creation constitutes a perfect defense.\textsuperscript{226}

In applying these principles to actual cases, few problems arise so long as a taking of surface expression is at issue, normally of program code, or so long as wholesale duplication has occurred.\textsuperscript{227} In this respect, copyright protection against slavish imitation in English-speaking countries performs a function often left to unfair competition laws in some European Community countries. Beyond slavish duplication, however, courts and commentators in the developed countries disagree on how to distinguish the protectable expression of a computer program from its unprotectable ideas, and no consensus has emerged concerning the proper scope of protection in cases of nonliteral copying.\textsuperscript{228}

In the past, functional works—such as rule books, instruction manuals and printed forms—obtained only "thin" protection against

\textsuperscript{225} See Draft TRIPS Agreement, supra note 17, art. 7; see also infra text accompanying notes 352-56.

\textsuperscript{226} See supra notes 193-95 and accompanying text.

\textsuperscript{227} See generally 2 GOLDSTEIN, supra note 194, § 8.5.1.2 (citing authorities).

\textsuperscript{228} See generally OTA REPORT 1992, supra note 98, at 138-43 (citing authorities); see also Pamela Samuelson, A Case Study on Computer Programs, in GLOBAL DIMENSIONS OF INTELLECTUAL PROPERTY, supra note 3, at 284-318.
slavish imitation under domestic copyright laws owing to their chronically low level of personal expression and to the pressure they exert on the line of demarcation with patent law.229 The protection of computer programs, which entered codified copyright law for the first time in 1980,230 should logically have conformed to these precedents. In reality, some early decisions indirectly protected ideas, processes, systems and other functional matter by narrowing the idea-expression exclusion and by broadly extending the exclusive right to prepare derivative works.231 More recently, however, the United States federal appellate courts have revolted against these precedents and have begun to limit the scope of protection for computer programs. To the extent that the commercial value of innovative programs resides in their dynamic behavioral impact, these later decisions decline to treat a second comer's attainment of functional equivalence as infringement simply because of nonliteral similarities in "structure, sequence and organization."232

In the leading decision, Computer Associates International, Inc. v. Altai, Inc., a panel on the United States Court of Appeals for the Second Circuit rejected the notion that a computer program contains a single idea, determined by its functional task, for purposes of applying the idea-expression test in actions for infringement.233 Rather, the panel disaggregated an allegedly infringed program into a hierarchy of sub-programs organized in descending levels of

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abstraction. The panel then mandated application of a “successive filtering” test to exclude ideas and other unprotectable matter at each level of abstraction.\textsuperscript{234} For example, courts following this approach could not premise a finding of nonliteral copying on similarities that pertain to sets of modules necessary for efficient operations, to structural architecture bearing on efficiency, or to any technical ideas present in different structural subcomponents of the programs at issue. Also excluded from the calculus of protected expression are elements dictated by external factors, including standard programming techniques, mechanical specifications, compatibility requirements, manufacturers’ design standards, and functional demands of the industry being served.\textsuperscript{235} Two other federal appellate decisions make it easier for second comers pursuing their private entrepreneurial interests to reverse engineer a copyrighted computer program in order to reveal the underlying technical ideas that anyone is free to use.\textsuperscript{236}


\textsuperscript{235} Computer Assocs., 982 F.2d at 706-12. See also Brown Bag Software, 960 F.2d at 1475-77 (endorsing “analytical dissection” of computer programs to isolate protectable expression); Atari Games Corp. v. Nintendo of Am., Inc., 975 F.2d 832, 839-41 (Fed. Cir. 1992) (applying Second Circuit’s successive filtering test as consistent with Ninth Circuit’s precedent in Brown Bag Software).

\textsuperscript{236} See Sega Enters., Ltd. v. Accolade, Inc., 977 F.2d 1510 (9th Cir. 1992); Atari Games, 975 F.2d 832. These cases hold that when circumstances unduly restrict access to the noncopyrightable elements of a computer program, it is fair use for a potential competitor to decompile publicly distributed object code in order to reconstruct the originator’s undisclosed source code, so long as the second comer’s end product does not embody the originator’s protected expression and there is no misappropriation of trade secrets or any breach of fiduciary obligations. See Reichman, Overlapping Proprietary Rights, supra note 102, at 88-93, 98-109; infra text accompanying notes 251-55. This result follows from new and old Supreme Court decisions that prevent the exclusive reproduction rights of copyright law from indirectly protecting unpatented technical ideas, principles, processes, systems or methods of operation, which third parties must remain free to reverse engineer. See, e.g., Baker v. Selden, 101 U.S. 99 (1879); Bonito Boats, Inc. v. Thunder Craft Boats, Inc., 489 U.S. 141, 159-64 (1989) (stressing competitor’s right to reverse engineer unpatented products); Reichman, Programs as Know-How, supra note 10, at 691-93, 693 n.288; see also Brief Amicus Curiae of Eleven Copyright Law Professor in Sega Enterprises, Ltd. v. Accolade, Inc., 33 JURIMETRICS J. 147 (1992).
Taken together, these recent decisions have greatly expanded both the scope of noncopyrightable components that second comers can freely use and their ability to make intermediate copies for purposes of reverse engineering, notwithstanding formal protection of computer programs as literary works in United States copyright law. Although program code and the surface expression of applications programs continues to qualify when they manifest creative authorship, and wholesale duplication of any program is still likely to infringe, the protection of internal structural elements and of technical solutions that reside in operating systems programs or in the relevant user interfaces will be cut back if present trends continue.

If one then extrapolates these trends to the situation in developing countries, it suggests that software producers in these countries need not feel unduly constrained in their choice of business strategies by the copyright provisions of the Draft TRIPS Agreement. To be sure, aggressive eradication of piratical copying could adversely affect countries that possessed no appreciable technological capabilities of their own in the software sector, and it could increase their dependence on foreign suppliers. However, least-developed countries have ten years to build up their capabilities before the TRIPS provisions take effect, and they may adjust the application of these provisions to their economic capabilities even after the initial deferment has elapsed.

As regards developing countries that do possess a technological


238. See Draft TRIPS Agreement, supra note 17, art. 66(1); Draft Understanding on Disputes, supra note 17, art. 22.1; Draft Final Act, supra note 17, § B(1) (Measures in Favour of Least-Developed Countries). See also infra text accompanying notes 333, 343-44.
foundation in the software sector,\textsuperscript{239} overly broad application of copyright norms to functional design solutions could hinder reimplementaton, recustomization, and systems integration at the local level and could generally retard the pace of incremental improvements and adaptations. Because firms in developing countries that reimplement foreign software designs often acquire copyright interests of their own in the protectable components of these programs, both the foreign originator and the local adaptor may share an interest in repressing piratical copies, as the Draft TRIPS Agreement would require.\textsuperscript{240} These interests diverge with respect to the desired scope of protection, however. Originators in developed countries will want courts in developing countries to favor a broad view of protected expression, while second comers in developing countries will advocate free access to all technical design solutions engineered abroad (but not necessarily for design solutions that happen to be created locally). Second comers will also argue against allowing foreign copyright owners to maintain unfettered control over design solutions that become de facto standards in the interests of greater compatibility between different operating systems and of lowering barriers to entry.\textsuperscript{241}

As matters now stand, nothing in the Draft TRIPS Agreement impedes developing-country administrators or tribunals from following the more restrictive lines of foreign decisions concerning copyright protection of computer programs.\textsuperscript{242} Nor must second comers in developing countries overcome any greater legal obstacles than those that small- and medium-sized firms generally face when competing against established larger firms. The decision to entrust the protection of computer programs to copyright law as literary works with no corresponding prohibition against the copying of unprotectable functional components may thus boomerang against its proponents at the international level. In effect, it endows competitors in developing countries who are willing to master

\textsuperscript{239} See supra note 108 (describing software capabilities of developing countries).
\textsuperscript{240} See Draft TRIPS Agreement, supra note 17, arts. 9-13; see also Schware, supra note 105, at 152; Gopinath & Ravishankar, supra note 105, at 12.
\textsuperscript{241} Cf., e.g., OTA REPORT 1992, supra note 98, at 138-43.
\textsuperscript{242} See supra notes 232-37 and accompanying text.
lawful techniques of reverse engineering with promising prospects, indeed, as will become clearer from the discussion of trade secret law below.243

Entrepreneurs in developing countries must, therefore, carefully evaluate their strategic options. For example, they should avoid cloning stylistically determined elements of, say, a foreign user interface, but given the appropriate judicial support, they need not refrain from cloning unpatented, functionally determined components. In appropriate circumstances, they may reuse individual commands or even the conventions for communication with other programs. Access to standard solutions needed to achieve networking efficiencies could be justified in the local context. Entrepreneurs also remain free to reverse-engineer technical ideas by "clean room" procedures and to use those ideas in independently created functional solutions of their own.244

That these and similar techniques may remain legally permissible does not always make them the best strategic choices, however. On the contrary, independent efforts to develop computer programs that meet local industrial and administrative needs can pay bigger dividends over time than reimplementing foreign products. Moreover, the potential benefits from obtaining the most up-to-date software by means of direct investment, licensing or other arrangements should always be weighed against either reimplemention or independent creation.245

Meanwhile, the high cost of obtaining foreign computer programs for educational and training purposes could well become the most pernicious consequence of strengthened copyright regimes, at least until distant suppliers perceive the potential benefits of establishing local subsidiaries.246 Ironically, whereas the monopolistic pricing of patented computer programs can be challenged under Article 31(b) of the Draft Agreement and unreasonably priced in-

243. See infra text accompanying notes 260-63.
244. Cf. supra notes 232-37 and accompanying text.
245. See, e.g., Schwarze, supra note 105, at 150, 156-57; see also OTA REPORT 1992, supra note 98, at 98-99.
246. See, e.g., Hamelink, supra note 224; supra note 188 and accompanying text.
struction manuals would probably fall within existing concessions to developing countries under the Appendix to the Berne Convention, 247 no express provision has been made for compulsory licenses to reduce the costs of copyrighted computer programs for educational purposes. The developing countries may, therefore, press for the inclusion of computer programs within the Berne Appendix at future negotiations in the relevant multilateral forums. 248

III. ANCILLARY PROPRIETARY REGIMES

A. Trade Secrets

1. Acquisition of Technological Innovation Through Reverse Engineering

In modern economies driven by constant technological improvement, trade secret law regulates the pace of competition by protecting innovators against commercial bribery and industrial espionage while endowing second comers with an absolute right to reverse-engineer unpatented innovation. 249 Assuming that any given innovation fits within the operative definitions of "trade secret," 250 its originator obtains no exclusive rights to make, use, sell or reproduce it in the manner of patents or of other statutory intellectual property rights. Rather, third-party acquisition of secret knowledge becomes actionable only when obtained by improper means, that is to say, in ways that are excluded by private contractual agreement or that violate a confidential relationship or that otherwise

247. See supra notes 124-132, 186-88 and accompanying text.
248. See infra text accompanying notes 335-39 (discussing framework for future negotiations).
249. See, e.g., Kewanee Oil Co. v. Bicron Corp., 416 U.S. 470 (1974); 2 ROGER M. MILGRIM, MILGRIM ON TRADE SECRETS, § 7.08[2][f] (rev. ed. 1992); Reichman, Overlapping Proprietary Rights, supra note 102, at 93-98 (citing other authorities).
250. Under the standard model used in this country, state trade secret laws generally cover "any formula, pattern, device or compilation of information" that confers a business advantage over competitors, so long as it is sufficiently definite and not commonly known in the trade and so long as reasonable precautions are taken to preserve its secrecy. See, e.g., RESTATEMENT OF TORTS § 757 cmt. b (1939); UNIF. TRADE SECRETS ACT § 1(4), 14 U.L.A. 433 (1985) [hereinafter UTSA]. For comparisons with the United Kingdom, see ALLISON COLEMAN, THE LEGAL PROTECTION OF TRADE SECRETS 8-9 (1992) and FRANCIS GURRY, BREACH OF CONFIDENTIALITY 90-97 (1989).
offend public policy.\textsuperscript{251} Trade secrets that are voluntarily revealed, insufficiently guarded or reverse-engineered lose all protection and become subject to free competition. Producers who attempt contractually to limit the reverse engineering of unpatented innovation run the risk that courts will hold such restrictions unenforceable.\textsuperscript{252}

Because trade secret law reinstates the lead-time advantages that a wrongful taking of undisclosed information may have neutralized, it provides an incentive to develop incremental innovation not meeting the nonobviousness standard of patent law.\textsuperscript{253} In the United States, the economic importance of this function has led to widespread adoption of the Uniform Trade Secrets Act, which largely overcomes obsolete conceptual distinctions between "torts" and "property rights."\textsuperscript{254} Article 39 of the Draft TRIPS Agreement, which mandates some form of trade secret protection in all participating countries,\textsuperscript{255} would probably require even the United States

\begin{footnotesize}
\begin{enumerate}
\item \textsuperscript{251} See, e.g., UTSA, \textit{supra} note 250, \S\ 1(2); \textit{Kewanee Oil}, 416 U.S. at 476, 490; Rockwell Graphic Sys., Inc. v. DEV Indus., 925 F.2d 174, 179 (7th Cir. 1991) (Posner, C.J.) (suggesting that federal patent law would preempt a theory that gave the trade secret holder a property right valid against the world).
\item \textsuperscript{253} See, e.g., UTSA, \textit{supra} note 250, \S\ 2(b); 3 LADAS, \textit{supra} note 152, at 1617; David D. Friedman, William M. Landes, & Richard Posner, \textit{Some Economics of Trade Secret Law}, 5 J. ECON. PERSP. 61, 70 (1991). \textit{See also} Edmund W. Kitch, \textit{The Law and Economics of Rights in Valuable Information}, 9 J. LEGAL STUD. 683-93, 699-701, 711-23 (1983); John C. Stedman, \textit{Trade Secrets}, 23 OHIO ST. L.J. 4 (1962). The peculiarities of trade secret law imply certain practical limitations that investors ignore at their peril. Apart from the inherent risk of lawful reverse engineering, for example, the measures necessary to maintain legal secrecy can become costly and burdensome over time and, at the limit, they can hinder authorized third parties from efficiently exploiting the innovation. Even when innovators prove misappropriation of their trade secrets to a court's satisfaction, say, by showing that a competitor had bribed their employees, domestic courts usually limit injunctive relief to the estimated period required for reverse engineering by fair means. \textit{See, e.g., Rockwell Graphic Sys.}, 925 F.2d at 179-80; \textit{Integrated Cash Management Servs. v. Digital Transactions}, 920 F.2d 171, 174-75 (2d Cir. 1990); \textit{see also} DRATLER, \textit{supra} note 137, \S\ 4.04[7][a].
\item \textsuperscript{255} \textit{See Draft TRIPS Agreement, supra} note 17, art. 39 ("Protection of Undisclosed
to enact a federal trade secrets statute. Such a statute might deviate from current practices under some state laws, and other countries would remain free to provide a narrower range of protection than some courts or legislatures have made available in the United States.

An international obligation to enact trade secret legislation would put developing-country entrepreneurs under no greater burdens than those applicable to competitors elsewhere.\(^{256}\) Without conferring any protection against copying as such, it would entitle these entrepreneurs to the same lead-time advantages that accrue to entrepreneurs in developed countries and it would shield them all

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Information\(^{\text{a}}\)). Article 39 tracks the UTSA to a certain extent. Compare Draft TRIPS Agreement, supra, art. 39(2) with UTSA, supra note 250, § 1(4). However, Article 39(2) avoids the "improper means" language of the American model in favor of the test already embodied in the Paris Convention, supra note 27, art. 10(4), viz. "in a manner contrary to honest commercial practices." See also Draft TRIPS Agreement, supra, art. 39(1) (expressly incorporating by reference Paris Convention Article 10(4) on unfair competition).

A footnote to Article 39(2) of the Draft Agreement states that for "the purposes of this provision 'a manner contrary to honest commercial practices' shall mean at least practices such as breach of contract, breach of confidence and inducement to breach, and includes the acquisition of undisclosed information by third parties who knew, or were grossly negligent in failing to know that such practices were involved in the acquisition." See also Reichman, GATT Connection, supra note 8, at 780-85, 784 n.154 (noting that the phrase in question refers to "honest practices established in international trade," which local custom cannot override).

256. Cf. Soltysinski, supra note 254, at 346-55. Historically, the protection of trade secrets engenders fears that single innovators might create absolute and long-lasting barriers to entry through nondisclosure of their discoveries. The patent system counters this threat by encouraging full disclosure of technological breakthroughs in exchange for short-term monopoly rights. The developing countries' attitude toward trade secret law remains largely colored by this nineteenth century tradition, which to some extent rests on the legendary figure of the solitary inventor. See, e.g., de Almeida, supra note 10, at 77.

In twentieth-century economies based on constant technological innovation and team research conducted along scientific lines, often in universities or research institutes, the ability of any single firm to prevent others from duplicating undisclosed research results after an initial breakthrough has greatly diminished. As the distinction between theoretical and applied science also breaks down, a tendency to embody applied scientific know-how in products distributed on the open market shortens product cycles and leads to problems of chronic underprotection. See e.g., Reichman, Programs as Know-How, supra note 10, at 656-69 ("Incremental Innovation Bearing Know-How on Its Face"); infra text accompanying notes 260-63.
from certain unethical conduct within the larger framework of Article 10bis of the Paris Convention. The enactment of such regimes should, therefore, stimulate local innovation besides facilitating various forms of foreign investment.

To operate successfully under statutory trade secret laws, the developing countries must realign the concept of "transfer of technology" with the nature of competition in open markets. From this perspective, technology is neither given away in response to altruistic promptings of foreign policy nor is it acquired by industrial espionage or by copycat duplication that avoids contributions to the actual cost of research and development. Rather, unlicensed technology is transferred through self-help methods of reverse engineering; and the international regime of trade secret protection would legitimate this practice against future complaints from those oligopolistic enterprises whose initial comparative advantages were subsequently eroded.

Some, of course, will argue that the developing countries lack capacity to reverse engineer by proper means, and no one can deny that they face formidable handicaps or that their limited technological infrastructures foster dependence on foreign technologies. Yet, one should not overemphasize traditional handicaps associated with closed economies when assessing competitive prospects in open economies, if only because the skills needed to reverse-engineer foreign technologies are available on the global labor market.

Although successful reverse engineering requires investment and risk taking, it can pay handsome dividends. For example, it roots the technology in the local culture, which provides a basis for future research and development. It stimulates improvements on the original technology or local adaptations of little interest to distant suppliers, and it often leads to lower priced, substitute products. Local adaptations and improvements may have export poten-

257. See supra note 255 and accompanying text.
258. See, e.g., IPRs and FDI, supra note 23, at 32; Corea, supra note 254, at 452-54, 468; see also Robert M. Sherwood, A Microeconomic View of Intellectual Property Protection in Brazilian Development, in INTELLECTUAL PROPERTY RIGHTS, supra note 41, at 116-29.
tial as well. If so, domestic firms that had acquired export capacity through reverse engineering would normally avoid foreign border control measures levied against exporters of counterfeit goods; and they would also avoid export restrictions applicable to firms that produced patented goods locally under the compulsory licenses that the Draft TRIPS Agreement elsewhere continues to authorize.  

2. The Know-How Gap in TRIPS

The potential dividends accruing from the reverse-engineering of unpatented, noncopyrightable technologies in general are magnified many times over when the newest cutting-edge technologies are at stake, notably biogenetic engineering, computer programs, computer-aided design, and other information-based endeavors. This follows because the applied scientific know-how underlying these important new technologies is often embodied in tangible products distributed in the open market, which renders classical trade secret protection of doubtful efficacy. Because each of these products "bears its know-how on its face," third parties who lawfully obtain some physical embodiment of that know-how can counter the originator's initial competitive advantage by reverse engineering his or her unpatented, noncopyrightable information and by incorporating it into lower-priced substitute products of their own making.  

Paradoxically, today's most refined technical achievements are often among the most accessible to reverse engineering, which threatens lead time to the point of discouraging investment in research and development. On the one hand, patent law excludes the bulk of new technological innovation that represents routine or merely incremental advances over the prior art. On the other hand, because of their functional character, the new technologies are alien to the spirit of copyright law, which traditionally avoids intruding on the domain of industrial property law.

259. See supra text accompanying notes 126-35, 156-62.
260. Reichman, Programs as Know-How, supra note 10, at 656-62 ("Incremental Innovation Bearing Know-How on Its Face").
262. See Reichman, Legal Hybrids, supra note 114, at 349-61.
United States cases limiting copyright protection of computer programs illustrate this principle.\textsuperscript{263} To address this problem, the developed countries will either have to formulate sui generis laws to protect applied scientific know-how or negotiate restrictions on the reverse-engineering of unpatented, noncopyrightable technologies within the framework of international unfair competition law. In the meantime, by ignoring the problem of applied scientific know-how as such, the Draft TRIPS Agreement has left a gap in the international legal protection of high technology.\textsuperscript{264} This gap provides entrepreneurs in developing countries with major opportunities, notwithstanding the international obligation to protect trade secrets under the Draft TRIPS Agreement, provided that they are willing and able to master the art of reverse-engineering that is crucial to present-day competition in the rest of the world.\textsuperscript{265}

Perhaps the biggest threat to these opportunities, besides technological lag, is the aggressive licensing tactics of foreign innovators, who will try to limit the effective transfer of technology by contractual agreement.\textsuperscript{266} However, avoiding abusive licensing agreements concerning the transfer of know-how requires nuanced legal criteria that often differ from those applicable to cases in which misuse of patents is alleged. In some respects, the inherent vulnerability of unpatented innovation to reverse engineering by

\textsuperscript{263} See supra notes 232-36 and accompanying text; see also Reichman, Overlapping Proprietary Rights, supra note 102, at 88-101.

\textsuperscript{264} See, e.g., Reichman, GATT Connection, supra note 8, at 875 (advocating emergency anti-piracy agreement for applied scientific know-how within Article 10\textsuperscript{th} of Paris Convention and predicting this gap).

\textsuperscript{265} See supra notes 252-58 and accompanying text.

\textsuperscript{266} See supra notes 166-72, 219-225 and accompanying text; infra notes 370-71 and accompanying text. In the European Community, contractual restrictions on the transfer of undisclosed technological know-how are strictly regulated in the interest of free competition. See, e.g., Guillermo Cabanellas & José Massagué, Know-How Agreements and EEC Competition Law 57-238 (1991); Valentine Korah, Know-How Licensing Agreements and the EEC Competition Rules: Regulation 556/89 (1989); see also Hans Ulrich, Patents and Know-How, Free Trade, Interenterprise Cooperation and Competition Within the Internal European Market, 23 I.L.C. 583 (1992). In the United States, courts take a case-by-case approach and usually apply a rule of reason. See, e.g., 2 Milgrim, supra note 249, § 6.05.
third parties should entitle licensors of know-how to greater contractual freedom than administrators would tolerate in the case of patents. Tough restrictions in know-how agreements that apply for a very short period of time may thus pass muster even though they would not be upheld if applied to licensees of patented inventions. In other respects, contractual limits on know-how licensees are more severely regulated than those applicable to patent licensees because courts and administrators may see them as unreasonably curtailing the public’s right to reverse engineer unpatented innovation.

Developing countries that regulate know-how licensing agreements must, therefore, proceed with particular caution lest they unduly inhibit foreign firms from bringing or disclosing the desired technology. For example, regulations that limit contractual restrictions on a licensee’s use of know-how once it becomes publicly known are defensible, as are measures to counter so-called “shrink-wrap” licenses that impede purchasers from reverse-engineering mass-produced, publicly distributed software.267 In contrast, agreements that constrain licensees from reverse-engineering undisclosed components of the transferred technology or from using that same technology for a fixed period after expiration of the agreement may prove economically reasonable in particular cases. Such clauses alleviate the licensor’s fears of having to compete with his own licensees, who are privy to his secrets, as well as with third parties who reverse-engineer on their own.268

By the same token, proposals to register trade secrets for administrative purposes269 risk vitiating the incentives to innovation and its diffusion that inhere in trade secret laws without conferring

267. Cf. Draft TRIPS Agreement, supra note 17, art. 39(2); see also Soltyssinski, supra note 254, at 355-56; Rice, supra note 252.

268. But see Correa, supra note 254, at 487-89 (reviewing authorities on both sides, but agreeing with those who would forbid clauses restricting use after expiration of the license agreement).

any solid proprietary interest sufficient to overcome risk aversion. In general, developing countries stand to gain more from hybrid legal regimes that directly reward disclosures of unpatented technologies, such as utility model laws and so-called patents of introduction, as discussed below, than from legal restrictions on trade secrets as such.\footnote{See infra notes 306-23.}

In sum, developing-country regulators will increasingly need to strike a delicate balance between the licensor’s need to preserve reasonable lead-time advantages and the would-be competitor’s need to implement his or her right to reverse-engineer unpatented technologies. To achieve this balance, regulators must be prepared to tolerate short-term licensing constraints, while taking pains to defend lawful forms of reverse engineering that are recognized in developed countries. Ideally, both developed and developing countries would coordinate their efforts in regulating know-how licensing agreements within the consultative framework that Article 40 of the Draft TRIPS Agreement seeks to establish.\footnote{See Draft TRIPS Agreement, supra note 17, art. 40; infra notes 368-71.}

B. Other Proprietary Regimes

The Draft TRIPS Agreement mandates intellectual property protection for industrial designs, plant varieties, and integrated circuit designs.\footnote{See Draft TRIPS Agreement, supra note 17, arts. 25-26 (industrial designs), 27(3)(b) (plant varieties), 35-38 (integrated circuit designs).} A priori, one may assume that the developed countries would not have pressed for the inclusion of these instrumentalities without expectations of gaining from them. Nevertheless, policymakers in developing countries must avoid the tendency to view any positive intellectual property benefit for developed countries as necessitating a loss to themselves, in the same way that the developed countries’ negotiators must desist from characterizing the developing countries’ acquisition of technology as a loss to the former’s own economic establishment. The real determinants of competitive success in these fields seldom hinge on intellectual property rights, and the effects of these rights vary
considerably even among developed countries whose technical infrastructures appear comparatively homogeneous.

In principle, intellectual property laws rooted in modest requirements of creativity allow the market to determine value. They tend, therefore, to broaden access to markets and to provide a sweepstakes reward that any entrepreneurs who enter the game might win, provided that contenders possess the technological foundation to play at all and the ability to overcome other barriers to entry.

1. Industrial Designs

The developed countries enjoy a clear advantage in advanced sectors of industrial design. However, more traditional sectors of design rooted in aesthetic appeal rather than technical efficiency remain wholly accessible to firms in developing countries. Local designers can profit from indigenous cultural resources not readily available to foreign competitors, and designs so inspired may have potential export value as well. To the extent that local firms investing in design development need to hire foreign expertise, a design protection law diminishes risk aversion by deterring free-riders from unlicensed imitation until the innovator has obtained the opportunity to recoup his or her investment.

Given the continuing lack of international consensus concerning this subject, participating states remain free to draft their design protection laws with local objectives in mind. Such laws need not recognize functionally determined designs, despite a European trend in this direction, although textile designs must be protected either in a design law or in copyright law.

Current United States law appears to accommodate both of

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274. See, e.g., J.H. Reichman, Design Protection and the Legislative Agenda, 55 LAW & CONTEMP. PROBS. 281, 282-84 (1992) [hereinafter Reichman, Legislative Agenda].
276. See Draft TRIPS Agreement, supra note 17, art. 25(1); infra notes 278, 285 and accompanying text.
277. See Draft TRIPS Agreement, supra note 17, art. 25(2).
these properties. However, Article 25(1) of the Draft TRIPS Agreement requires parties to “provide for the protection of independently created industrial designs that are new or original,” whereas United States design patent law requires candidate designs to meet both a novelty and a true nonobviousness standard. The TRIPS drafters clearly intended “originality” to entail more of a creative contribution than mere independent creation because they used the two terms to convey different meanings in the same provision. “Originality” in foreign design law normally signifies less than nonobviousness, although until recently the two terms were more or less synonymous under the United Kingdom’s registered design law of 1949, which resembled the United States design patent law. Nevertheless, given the drafters’ deliberate emphasis

278. For the exclusion of functionally dictated designs from the design patent law, which protects ornamental designs of useful articles, see 35 U.S.C. §§ 171-73 (1988); Reichman, Designs and New Technologies, supra note 152, at 37-42, 47-53. Original fabric designs, which would not normally qualify for design patent protection in the United States, are eligible for copyright protection as pictorial works, although dress designs are not. See, e.g., 17 U.S.C. §§ 101, 113(b) (1988) (definition of pictorial, graphic and sculptural works and limits of protection); Mazer v. Stein, 347 U.S. 201 (1954); Reichman, supra, at 59-61. Most three-dimensional designs of useful articles are not protected in United States intellectual property law at all because they either fail to meet the novelty and nonobviousness criteria of patent law or they contain no copyrightable, aesthetic features that can exist separately from, and independently of, their utilitarian aspects. See Reichman, supra, at 45-81. However, three-dimensional product designs are frequently protected for an unlimited time as “appearance trade dress” under Section 43(a) of the Lanham Act, which operates as a de facto federal law of unfair competition. See id. at 81-123; see also Ralph S. Brown, Design Protection: An Overview, 34 UCLA L. REV. 1341 (1987); J.H. Reichman, Past and Current Trends in the Evolution of Design Protection Law—A Comment, 4 FORDHAM INTELL. PROP., MEDIA & ENT. L.J. 387, 392 (1993).

279. See Draft TRIPS Agreement, supra note 17, art. 25(1).


281. See supra text accompanying note 279 (quoting Draft TRIPS Agreement, Article 25(1)).

on “nonobviousness” in the patent provisions of the Draft Agreement and on “originality” in its design protection provisions,\textsuperscript{283} one must conclude that the latter criterion conflicts with the eligibility requirements of the domestic design patent law.

Article 25 thus appears to represent a backhanded attempt to oblige Congress to align the legal protection of industrial designs in this country with more protectionist trends abroad, despite the failure of sectoral lobbyists to achieve a similar result in recent years.\textsuperscript{284} In this connection, efforts to harmonize the design laws of the European Community could lead to widespread protection of functional designs in sui generis laws more or less modelled on the United Kingdom’s unregistered design law of 1988.\textsuperscript{285} This law protects both functional and aesthetic designs against copying for a period of ten to fifteen years while imposing only the soft sub-

\textsuperscript{283} Compare Draft TRIPS Agreement, supra note 17, art. 27(l) (providing that patentable “inventions . . . are new, involve an inventive step [i.e., “nonobviousness,” as explained in footnote 1 to this same Article] and are capable of industrial application”) with id. art. 25(l) (requiring parties to protect “independently created industrial designs that are new or original”).


\textsuperscript{285} See Copyright, Designs and Patents Act, 1988, 2 Eliz. 2, ch. 48, §§ 213-264 (U.K.) (unregistered design right applicable to both functional and aesthetic designs); Fellner, supra note 282, at 377. For the European Commission’s proposals along these lines, see Hugh Griffiths, Overview of Developments in Europe on Industrial Design Protection, 4 FORDHAM INT’L. PROP., MEDIA & ENT. L.J. 359 (1993).
stantive and formal characteristics of copyright laws generally. The Draft TRIPS Agreement in its present form would not require any participating country to adopt a similar model. However, once a reform of the United States design patent law became necessary by dint of Article 25, the trend favoring copyright-like protection of functional designs displaying no appreciable quantum of creativity could appear irresistible despite its overall anticompetitive effects.

Meanwhile, exporters in both developed and developing countries should note that designs meeting the requirements of domestic design laws could nonetheless violate foreign design laws based on different criteria. For example, exported designs could sometimes violate the United Kingdom’s unregistered design right, which protects both functional and appearance designs, as well as copyright laws, especially in France, or laws that treat three-dimensional product configurations as unregistered trademarks, especially in the United States.

2. Plant Varieties

As noted earlier, the revised UPOV Convention framework, incorporated by reference into the Draft TRIPS Agreement, allows (and sometimes requires) participating countries to protect new and distinctive plant varieties outside of the domestic patent laws. But this option, after the 1991 revision of the UPOV Convention, may also provide both foreign and domestic breeders with a stronger, more patent-like form of protection than was previously available under the sui generis approach.

The developing countries as a whole reportedly stand to gain more from protecting plant breeders’ rights under the UPOV Convention framework than under the domestic patent laws. Howev-

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287. See Draft TRIPS Agreement, supra note 17, art. 5; supra notes 283-84 and accompanying text.
289. See supra notes 74-76 and accompanying text.
290. See supra notes 84-91 and accompanying text.
291. See, e.g., Lesser, supra note 73, at 68; Frischtak, supra note 80, at 13-15.
er, the long-term economic effects of the 1991 amendments to the UPOV Convention on these countries remain to be evaluated. The farmers’ obligation to pay royalties for the use of certain hybrid food varieties has already stirred resentment in some developing countries and, to the extent that foreign firms continue to dominate the trade, such resentment could grow.292

By the same token, the United States will have to decide whether to revise its Plant Variety Protection Act293 in order to take advantage of the amended UPOV Convention treaty. Besides allowing for the imposition of a longer and stronger form of protection, these amendments permit cumulation of the patent and sui generis approaches, which domestic law currently forbids.294

3. Integrated Circuit Designs

In effect, integrated circuit laws modelled on the United States Semiconductor Chip Protection Act of 1984295 provide a glorified form of trade secret protection augmented by a specific anti-copying provision. An exclusive right of reproduction prevents competitors from duplicating a protected chip as such. But an absolute right to reverse engineer permits reproduction for analytical use when it leads to independently created chip designs.296 The chip laws thus preserve an originator’s lead time against outright copying, while encouraging second comers to abbreviate that lead time by rapid reverse engineering and by fashioning the improvements to which it naturally leads.297

The Draft TRIPS Agreement largely tracks the Washington Treaty on Integrated Circuits (‘‘Washington Treaty’’), opened for

292. See, e.g., Dasgupta, supra note 83, at 855-58; supra notes 89-90 and accompanying text.
293. See PVPA, supra note 73.
294. See supra notes 73-85 and accompanying text.
297. See, e.g., Leo J. Raskind, Reverse Engineering, Unfair Competition, and Fair Use, 70 MIND. L. REV. 385, 402 (1985); see also Reichman, Overlapping Proprietary Rights, supra note 102, at 110-16.
signature in 1989, which means that developing countries could incur burdensome administrative obligations to police articles that incorporate allegedly infringing semiconductor chip designs.298 Article 35 of the Draft Agreement appears to exclude the broad compulsory license provisions sought by the developing countries during negotiations on the Washington Treaty. But Article 37(2) rather offhandedly leaves the door open to unspecified public-interest regulations, including the compulsory licenses allowed for involuntary use of patents under Article 31.299

Except in special circumstances pertaining to unreasonably priced imports, the presence or absence of compulsory licenses should little affect an entrepreneur’s innovative prospects in view of his or her right to reverse engineer a protected chip and to apply its teaching to independently created chip designs.300 Technical barriers to entry remain formidable, however, even if legal barriers are not. The increased complexity of chip design in recent years, the correspondingly higher costs of development and production, and the increasingly incestuous relations between purchasers and manufacturers all tend to limit the prospects for developing countries in this field.301 By the same token, enactment of chip laws in


299. Compare Draft TRIPS Agreement, supra note 17, art. 35 (excluding art. 6(3) of IPIC Treaty) with IPIC Treaty, supra note 298, art. 6(3)(a) (compulsory licenses in general) and id. art. 6(3)(b) (compulsory licenses concerning free competition and abuses); see also Draft TRIPS Agreement, supra, arts. 31(a)-(k), 37(2), 40(2); supra text accompanying notes 117-46.

300. See supra note 296 and accompanying text.

301. See, e.g., John G. Rauch, The Realities of Our Times: The Semiconductor Chip Protection Act of 1984 and the Evolution of the Semiconductor Industry, 75 J. PAT & TRADEMARK OFF. SOC’Y 93, 121 (1993); Correa, supra note 298, at 84-86. Nevertheless, South Korea and Taiwan Province of China have reportedly made inroads on the market. Other developing countries in Asia and Latin America have established some capacity for the production of custom and semi-custom chips by adopting appropriate CAD (computer-aided design) tools and by locating ancillary manufacturing outlets abroad. Correa, supra, at 84-86.
developing countries seems unlikely to increase foreign investment in this sector because other technological and economic factors remain of paramount importance. 302

4. Miscellaneous Hybrid Regimes

The push for sui generis laws to protect integrated circuit designs has implanted a protectionist virus at the heart of the world’s intellectual property system, which nominally rests on the patent and copyright models enshrined in the Paris and Berne Conventions. 303 The effects of this virus appear in the United Kingdom’s decision to confer copyright-like protection on functional designs in 1988, a conceptually anomalous solution that the Commission of the European Communities appears ready to endorse. 304 These ad hoc responses to a deepening systemic crisis beg the question of why certain functional designs merit an exemption from the discipline of the marketplace more than other classes of socially valuable innovation that are no less vulnerable to free-riding duplicators. They also look increasingly like the disguised barriers to trade that Article XX(d) of the GATT aimed to forestall. 305

By the same token, nothing prevents developing countries from adopting hybrid legal regimes, with a view to modifying the incentive structures of present-day patent systems along the lines of historical models that many industrialized countries favored at earlier stages of their economic development. 306 Utility model laws, patents of introduction and industrial development patents merit particular attention in this context.

a. Utility models

The pristine purpose of early utility model laws was to protect functional improvements of handtools and other everyday implements, including agricultural implements, that were achieved by

302. See, e.g., IPRs and FDI, supra note 23, at 31-32.
303. See generally Reichman, Legal Hybrids, supra note 114, at 326-35, 349-60.
304. See supra notes 276, 285-87 and accompanying text.
305. See, e.g., Reichman, GATT Connection, supra note 8, at 831-36, 884-85 (discussing relation of GATT, supra note 1, art. XX(d) to TRIPS).
306. See, e.g., Silverstein, supra note 269, at 305-06; Bercovitz-Rodriguez, supra note 9, at 2-3.
relatively novel, three-dimensional forms or shapes that typically lacked the inventive step required for patent protection. A similar example, the object of protection under Germany's prototypical utility model law was the external product configuration responsible for a technically more proficient tool or implement, and not the underlying technical idea or process involved. Such laws were of primary interest to local inventors, especially small- and medium-sized firms that adapted or improved foreign products.

Over time, utility model laws degenerated into longer and stronger petty patent regimes governing small inventions generally, which contradicts the economic and policy rationales that justify the patent monopoly. These laws provide virtually immediate,

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310. Both the Japanese and Italian authorities encouraged this evolution by relaxing the requirement of a three-dimensional shape as such. See, e.g., TERUO DOI, THE INTELLECTUAL PROPERTY LAW OF JAPAN 68-70 (1980); GIUSEPPE SENA, I DIRITTI SULLE INVENZIONI E SUI MODELLI INDUSTRIALI 515-549 (2d ed. 1984). The latest reform of the German utility model law, which took effect on July 1, 1990, abolished this requirement altogether and made electronic circuit designs eligible for the first time. See, e.g., Liesegang, supra note 307, at 3-4. Electronic circuit designs now qualify for utility model protection in Japan as well. See, e.g., Sadanari Amemiya & Kikuo Nishimoto, PATENTS and UTILITY MODELS, in DOING BUSINESS IN JAPAN, ch. 2, § 2.01[9][c] (Zentarō Kitagawa ed., 1990). Chemical substances, foodstuffs and immovables also became practicable under the German reform, but methods remain excluded. See Liesegang, supra, at 3-4.

311. See, e.g., FRANÇOIS PERRET, L'AUTORÉNOMIE DU RÉGIME DE PROTECTION DES
patent-like protection for a relatively short period of time, which now averages six to ten years. Eligibility standards resemble those of patent law, although courts tend to apply a softer merit test than that of nonobviousness; the standard of novelty is less absolute; and there is usually no substantive examination of the prior art.\textsuperscript{312} Recent amendments to the German law codify these lower standards of eligibility.\textsuperscript{313}

Developing countries are well advised to adopt utility model laws because of their proven efficacy in stimulating local adaptation and improvement of foreign inventions.\textsuperscript{314} The advent of mandatory patent regimes under the Draft TRIPS Agreement further validates this advice because governments in developing countries will want to encourage firms in the private sector to work around the deluge of patents likely to be filed in the future. Countries that adopt utility model laws must, however, provide foreign innovators with national treatment and with the priority rights established under the Paris Convention.\textsuperscript{315}

b. Patents of introduction

Authorities in developing countries may consider more innovative measures to encourage both foreign patentees to work their patents locally and nonpatentees (whether local or foreign) to introduce technologies that, for one reason or another, are not technically patentable under local law. For example, patents of introduction\textsuperscript{316} can be used to encourage domestic commercialization of

\textsuperscript{312}See, e.g., Liesegang, supra note 307, at 2-5; see also Doi, supra note 310, at 68-70, 73-75; Mario Fabiani, I Modelli e disegni industriali, in 2 TITO RA\v{N}A, DIRITTO INDUSTRIALE—INVENZIONI E MODELLI INDUSTRIALI 213, 216-22 (Mario Fabiani & Paolo Spada eds., 1988).

\textsuperscript{313}See, e.g., H\"{a}usser, supra note 308; Liesegang, supra note 307.


\textsuperscript{315}See Draft TRIPS Agreement, supra note 17, arts. 2(1), 3; Paris Convention, supra note 27, arts. 1(2), 2(1), 4C(1).

\textsuperscript{316}"Patents of importation (sometimes also called patents of introduction, confirmation or revalidation) are generally patents of relatively short duration granted for an invention . . . already . . . patented in a foreign country . . . . [Such an invention] therefore has
foreign technologies when the relevant utility patents have not been filed locally within the priority periods set by the Paris Convention. In such cases, developing countries can award patents of introduction either to the foreign patentee, notwithstanding a technical loss of novelty, or to nonpatentees (whether foreigners or nationals) willing and able to step into their shoes, on condition that grantees commit to working their special patents locally within a reasonable period of time.

To some extent, the Draft TRIPS Agreement has diminished the attractiveness of patents of introduction by overriding the local working requirements of the Paris Convention and by ensuring that patentees who file timely applications will obtain an exclusive right to supply even developing-country markets with reasonably priced imports. As a result, a threat by government authorities to issue patents of introduction in the absence of local working would no longer dissuade foreign patentees who had properly filed and obtained domestic utility patents from supplying the market by imports alone, although such patentees would remain subject to compulsory licenses if they charged excessive prices for their imports. Developing countries can still issue patents of introduction for foreign technologies that are not the object of timely patent applications in the countries concerned, and this could constitute a sizeable pool for some countries to work with, especially least-developed countries.

c. Industrial development patents

Adoption of a TRIPS agreement could also focus fresh attention on the “industrial development patent,” which the World Intellectual Property Organization (“WIPO”) proposed in 1974, precisely

lost its novelty, but is nevertheless protected by a patent of importation in the expectation that the patentee will exploit the invention in the country concerned.” BODENHAUSEN, supra note 119, at 26. See also Paris Convention, supra note 27, art. 1(4) (recognizing patents of importation [i.e., introduction] as patents for purposes, inter alia, of determining the objects of industrial property protection under Article 1(2) that are subject to national treatment, plus any international minimum standards that may or may not apply).

317. See Paris Convention, supra note 27, art. 4.
318. See, e.g., Silverstein, supra note 269, at 245-47, 305-09; 3 LADAS, supra note 152, at 1898-99, 1902-03; Bercovitz-Rodriguez, supra note 9, at 2-3.
319. See supra notes 126-35 and accompanying text.
320. See supra note 132 and accompanying text.
because this regime provides incentives for local working of unpatented technologies that could help to reduce the developing countries' dependence on imports.\textsuperscript{321} Such patents can be granted to any persons or firms, whether foreigners or nationals, who agree to establish operations in a developing country for the purpose of producing goods that are neither patented nor manufactured there already or of employing technological processes that are neither patented nor already used in the country concerned.

In practice, industrial development patents would replace the objective novelty and nonobviousness criteria of the mature patent system with softer criteria, tailor-made for local needs, in return for substantial investment in unpatented technologies not yet introduced locally. While similar in effect to some utility model regimes, they remain free of the historical baggage that links utility models with industrial design.\textsuperscript{322} Industrial development patents would operate rather like short-term, contractually guaranteed exclusive licenses from the state that override the public-domain status of specific technological products and that enable grantees to exclude imports of similar products from abroad. States granting these titles could thus stimulate local working of unpatented technologies without violating the Draft TRIPS Agreement in its present form.

The Draft Agreement also allows member states to devise intellectual property laws that exceed the requirements of prevailing international minimum standards.\textsuperscript{323} Developing countries that avail themselves of this privilege could provide special incentives to encourage private investment in sectors targeted for rapid development. However, both patents of introduction and industrial development patents have more to offer than ad hoc initiatives of this kind, and the case for resurrecting a limited monopoly for foreigners who teach the adaptation of alien technology locally deserves greater attention than it has so far received, especially in least-de-
veloped countries.

IV. INTEGRATING INTELLECTUAL PROPERTY INTO INTERNATIONAL ECONOMIC LAW

A. Ongoing Trade-Based Initiatives

Global economic integration requires that intangible creations, likely to become the most valuable form of property in the twenty-first century, should gradually be absorbed into the laws of state responsibility that otherwise protect alien property from confiscation and unlawful takings:

To pretend that aliens have no legal claims arising from wholesale, unauthorized uses of their most valuable property while respecting laws that protect less valuable alien property only because it is tangible rather than intangible is to exalt form over substance. Sooner or later, both private and public international law must assimilate intellectual property rights to the general international minimum standards that preserve comity by dissuading states from authorizing uncompensated uses of alien property on their national territories.324

As international minimum standards of intellectual property law become at least justiciable, if not enforceable, within the framework of the GATT’s dispute-settlement procedures,325 the historical predilection for purely territorial intellectual property rights will give way to international economic law at some cost to national sovereignty.

Viewed in its most positive light, a transnational market for intellectual goods defended against free-riding imports by border control measures and by international machinery for the settlement of disputes could become a vehicle for implementing cultural and industrial policies on a grand scale. The larger rewards potentially accruing from successful innovation under these conditions could

324. Reichman, GATT Connection, supra note 8, at 810-II; see generally id. 806-12 (citing authorities).
325. See infra text accompanying notes 347-59.
be factored into the aggregate investment calculus for research and development and for the dissemination of cultural products. To the extent that intellectual property laws overcome high risk-aversion by offering prospectors a kind of sweepstakes reward if they succeed, the stimulus afforded by minimum standards of legal protection operating across an enlarged and relatively undistorted market could greatly exceed that of similar laws operating in national markets that pursue different goals by different legal means. The ability of each legal subsystem to project more efficient uses of intellectual property throughout the worldwide domain governed by a TRIPS Agreement could thus magnify the capacity of the system as a whole to attain progressively higher levels of competition in the long run through appropriate short term restrictions on free competition.

On the negative side, the norms of international economic law represent a delicate balance between the interests of states at different stages of development, and the absorption of intellectual property will have to accommodate these norms and that balance. To the extent that an integrated world market becomes increasingly open and competitive, the desired equilibrium between legal protection of innovation and free competition must take account of the different economic policies of states at very different stages of development. Premature efforts to accelerate the process of harmonization without due regard to these differences and to the social costs of overcoming them could boomerang against those countries pressing for rapid change and could even widen the initial differences in the end.

1. Compensation as the New Master Principle

Developing countries fear that extraterritorial application of high—as distinct from minimum—international standards of intell-

328. See generally Reichman, GATT Connection, supra note 8, at 812-27.
329. See, e.g., Ullrich, supra note 7, at 140 (criticizing industrialized countries for attempting by "trade muscle . . . to achieve on a global level what European countries have only achieved on a very narrow scale within decades of continuous harmonization efforts").
lectual property protection will become a vehicle that allows the technology-exporting countries to wield industrial property control over both their domestic markets and the import markets of third countries.\textsuperscript{330} To bolster their prospects, the developing countries must ensure that both enhanced market access and technical cooperation to implement a TRIPS agreement are actually delivered as promised.\textsuperscript{331} They should insist that the developed countries renounce unilateral trade sanctions in future discussions of intellectual property protection, in conformity with Article 64 of the Draft TRIPS Agreement and with Articles 21 and 22 of the Draft Understanding on Rules and Procedures Governing the Settlement of Disputes under Articles XXII and XXIII of the GATT ("Draft Understanding on Disputes") to be incorporated into the Final Act of the Uruguay Round.\textsuperscript{332} The developing countries may also avail themselves of the transitional provisions in Articles 65-67 of the Draft TRIPS Agreement, while least-developed countries may invoke the longer transitional periods of Article 66(1) and are further entitled to benefit from special incentives favoring the transfer of technology under Article 66(2).\textsuperscript{333}

Nevertheless, one cannot realistically assume that the developed countries will relax their efforts to elevate international minimum standards of intellectual property protection once a TRIPS agreement has been signed, nor is it certain that they will altogether

\textsuperscript{330} See, e.g., id. at 158-59; see also CHAKRAVARTHI RAGHAVAN, RECOLONIZATION—GATT, THE URUGUAY ROUND & THE THIRD WORLD 114-41, 270-71 (1990); Dasgupta, supra note 83, at 855-58.

\textsuperscript{331} See Draft TRIPS Agreement, supra note 17, art. 67 (pledging developed countries to provide technical and financial assistance to both developing and least-developed countries); see also RAGHAVAN, supra note 330, at 273-78.

\textsuperscript{332} See Draft Understanding on Disputes, supra note 17, arts. 21 (Strengthening of Multilateral System), 22 (Special Procedures involving Least-Developed Contracting Parties); see also Draft TRIPS Agreement, supra note 17, art. 64 (incorporating an Integrated Dispute Settlement Understanding by reference).

\textsuperscript{333} See Draft TRIPS Agreement, supra note 17, arts. 65 (Transitional Arrangements), 66 (Least-Developed Countries), 67 (Technical Cooperation). Article 66(2) requires developed countries to "provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least-developed" countries. Id. art. 66(a); see also supra text accompanying notes 32-37 (illustrating transitional periods in regard to patents).
forego threats of unilateral sanctions in the pursuit of these standards. Article 71 of the Draft TRIPS Agreement establishes a specialized policy review mechanism in conjunction with the general Trade Policy Review Mechanism that the Draft Final Act proposes to institute. Periodic reviews under Article 71 could, in principle, substitute for the unilateral policy reviews currently undertaken by the trade representatives of the United States and the European Community. If so, they would logically become a vehicle for developed countries' efforts to obtain higher levels of intellectual property protection "in the light of ... new developments which might warrant ... amendment of this Agreement."

Similar pressures concerning matters not yet covered by the Draft Agreement could be exerted under Article 69, in which the parties "agree to cooperate ... with a view to eliminating international trade in goods infringing intellectual property rights." The attainment of higher standards in other negotiating forums, particularly those that WIPO administers, would almost certainly trigger trade-based initiatives to bring recalcitrant parties into line under all these provisions. Moreover, the Draft Understanding on Dis-

334. See, e.g., Robert E. Hudec, Dispute Settlement, in COMPLETING THE URUGUAY ROUND, supra note 18, at 180, 197-203; infra note 360 and accompanying text.
335. See Draft Final Act, supra note 17, Annex IV, Agreement Establishing the Multilateral Trade Organization, art. V(3); Draft TRIPS Agreement, supra note 17, art. 71 (Review and Amendment); see also Victoria Curzon Price, New Institutional Developments in GATT, 1 MINN. J. GLOBAL TRADE 87, 96-101 (1992).
336. Draft TRIPS Agreement, supra note 17, art. 71(4); see also Jackson, supra note 16, at 22-23.
337. See Draft TRIPS Agreement, supra note 17, art. 69 (International Cooperation). For the ambiguities inherent in this use of the term "infringing," and the self-serving uses made of it during the TRIPS negotiations, see Reichman, GATT Connection, supra note 8, at 769-96 ("Nonexistence of an International Norm Against Misappropriation").
putes expressly permits industrialized countries to complain about acts that do not in themselves violate GATT undertakings. Such complaints are likely to arise in regard to matters affecting the scope of protection under the different intellectual property regimes, which the Draft TRIPS Agreement seldom regulates in detail.

In principle, if developed countries demand higher or more expansive international minimum standards than those set out in the Draft TRIPS Agreement, they should be prepared to pay additional compensation to the developing countries for the resulting social costs. This compensation would typically consist of trade concessions enlarging market access. Without such compensation, the imposition of foreign legal standards on unwilling states in the name of “harmonization” remains today what Ladas deemed it in 1975, namely, a polite form of economic coercion.

2. Pitfalls of the Dispute-Settlement Process

Meanwhile, both developing and least-developed countries could experience real hardships in implementing agreed standards under the pending TRIPS provisions, while the true social costs of these provisions might exceed any trade concessions that are finally negotiated, at least with respect to some of these countries. In such an event, least-developed countries (as determined by the appropriate United Nations schedules) could appeal for particular consideration of their “special situation” under Article 22.1 of the Draft Understanding on Disputes. In grave cases, least-devel-

339. See Draft Understanding on Disputes, supra note 17, art. 24; see also Curzon Price, supra note 335, at 92 (noting that “GATT jargon distinguishing between ‘violation’ and ‘non-violation’ disputes . . . allows the panel procedure to apply to disputes arising from measures which do not formally violate GATT, but which do injure the trading interests of one’s partners”); Hudec, supra note 334, at 199-203 (noting that successful outcome of Uruguay Round could depend on willingness of U.S. to renounce trade sanctions for self-defined “unreasonable” restrictions on commerce not covered by GATT rules).


341. 1 LADAS, supra note 152, at 14-15; see also Ullrich, supra note 7, at 158-59.

342. See, e.g., Dasgupta, supra note 83, at 855-58.

343. See Draft Understanding on Disputes, supra note 17, art. 22.1 (requiring that “particular consideration shall be given to the special situation of least-developed coun-
oped countries could resort to section B(l) of the Draft Final Act, which overrides obligations inconsistent with the development needs and capabilities of these countries.  

Developing countries, in contrast, would want to invoke certain articles in the Draft Understanding on Disputes that require contracting parties to give “special attention to the particular problems and interests of developing countries.” Developing countries might also try to fall back on Article 71(l) of the Draft TRIPS Agreement, in the hopes of obtaining a modification extending the transitional period for those components of the Agreement responsible for the hardship in question.  

If, however, the Council on Trade-Related Aspects of Intellectual Property Rights, to be established under Article 68 of that same Agreement, failed to resolve the conflicting interests, a litigable dispute could rise that would trigger the revised dispute settlement provisions of the Draft Final Act.  

In principle, the nature of a developing country’s case could vary with its status as plaintiff or defendant. Developing countries that lodge complaints are automatically entitled to special consider-

344. See Draft Final Act, supra note 17, § B(1) (Measures in Favour of Least-Developed Countries).  
345. Draft Understanding on Disputes, supra note 17, art. 2.10; see also id. art. 10.12 (requiring GATT panel’s report to “explicitly indicate the form in which account has been taken of relevant provisions on differential and more-favorable treatment for developing countries that form part of the General Agreement and of the instruments negotiated in GATT under its auspices, which have been raised by the developing contracting party in the course of the dispute settlement procedures”).  
346. See Draft TRIPS Agreement, supra note 17, art. 71 (Review and Amendment). Article 71(l) allows the parties to “undertake reviews in the light of any relevant new developments which might warrant modification or amendment of this Agreement.”  
347. See Draft TRIPS Agreement, supra note 17, art. 68 (providing that a “Council on Trade-Related Aspects of Intellectual Property Rights shall monitor the operation of this Agreement and, in particular, PARTIES’ compliance with their obligations hereunder, and shall afford PARTIES the opportunity of consulting on matters relating to the trade-related aspects of intellectual property rights”); Draft Understanding on Disputes, supra note 17; Draft Final Act, supra note 17, §§ T (Elements of an Integrated Dispute Settlement System) [hereinafter Integrated Dispute Settlement System]; see also JOHN H. JACKSON, RESTRUCTURING THE GATT SYSTEM 56-80 (1990); Curzon Price, supra note 335, at 90-108.
ation for the economic impact of the measures in question on their national economic development. In contrast, when developing countries are sued for breach of their TRIPS undertakings, they must be prepared to shoulder the burden of proof and they will be relegated to such differential and more favorable measures as the Draft Final Act provides for each specific discipline it covers. No such measures appear in the Draft TRIPS Agreement other than the transitional provisions and the special provisions for least-developed countries that have already been discussed.

Notwithstanding this structural handicap, developing countries in difficulty (whether plaintiffs or defendants) will want to show good faith efforts to implement their TRIPS obligations, consistent with their own development needs, and they will logically appeal to the principle of differential and more favorable treatment enshrined in an Enabling Clause added to the GATT at the end of the Tokyo Round. The developed countries involved in the dispute would reject both of these defenses. Developed countries would argue for strict enforcement of the TRIPS obligations on the grounds that the trade concessions they provided constituted a quid pro quo for these very obligations. These countries would further contend that the Draft TRIPS Agreement had omitted any differential and more favorable provisions for developing countries precisely because these latter countries had waived or bargained away their rights under the Enabling Clause in exchange for the market

348. See Draft Understanding on Disputes, supra note 17, arts. 19.7, 19.8.
349. See Draft Understanding on Disputes, supra note 17, arts. 1.8, 10.11, 10.12; see also Curzon Price, supra note 335, at 107 (noting logical consequences of the “single undertaking” principle underlying Draft Final Act).
350. See supra notes 333, 343-44 and accompanying text.
access and other benefits flowing from the Draft Final Act as a whole. 352

While the responses of developing countries would vary with the circumstances and nature of the complaint, in most cases they would logically invoke the broad objectives and principles set out in Articles 7 and 8 of the Draft TRIPS Agreement. 353 As noted, Article 7 declares that the “protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.” Article 8(I) then specifies that parties may defend “the public interest in sectors of vital importance to their socioeconomic and technological development.”

To the extent that supervening events or changed conditions frustrated the attainment of these objectives, the developing countries concerned could plead that Articles 7 and 8 had failed of their essential purpose. 354 If upheld, this claim could support appeals to the nullification and impairment provisions of the GATT as well as to the differential and more favorable treatment otherwise guaranteed by the Enabling Clause, which arguably springs back to life if developed countries truly failed to realize the goals and principles set out in Articles 7 and 8. 355 Given the right set of facts, a developing country might strengthen its case by resort to Article 24.2 of the Draft Understanding on Disputes, which recognizes claims for impeding the attainment of any objectives embodied in the Draft Final Act. 356

352. See supra notes 16-18 and accompanying text.
353. See Draft TRIPS Agreement, supra note 17, arts. 7-8; supra text accompanying notes 143-46.
355. Cf., e.g., Hudec, supra note 334, at 199-203 (discussing nonviolation issues in relation to Article XXIII of the GATT); see also Enabling Clause, supra note 351.
356. See Draft Understanding on Disputes, supra note 17, art. 24.2 (exempting objectives falling within Article XXIII of the GATT).
Predicting the outcome of such litigation would be risky under the best of circumstances. If a developed country prevailed, it could apply cross-retaliatory sanctions to goods unrelated to intellectual property rights.357 But the likelihood that GATT panels would in fact ignore the special circumstances of any developing country other than those Newly Industrialized Countries that had graduated out of the Enabling Clause’s protective embrace seems speculative, indeed.358 For this and other reasons, the path of wisdom for all sides is to settle disputes arising under the TRIPS Agreement by negotiated compromises premised on the twin notions that developed countries must pay adequate compensation for the social costs of the intellectual property regimes they seek to impose and that the special circumstances of the developing countries must always be taken into account.359

Some developed countries may nonetheless continue to resort to unilateral action notwithstanding the clear wording of the Draft Understanding on Disputes with respect to the sanctity of multilateral measures.360 Such actions should be vigorously resisted, not only to defend the integrity of a multilateral process that the developed countries demanded in the first place,361 but also to avoid the formulation of arbitrary and premature standards of international intellectual property law that are likely to prove inefficient and

357. See Integrated Dispute Settlement System, supra note 347, arts. 1(b), (f) (Suspension of Concessions); see also Curzon Price, supra note 335, at 95 (noting hostility of developing countries to this provision).

358. See Enabling Clause, supra note 351, para. F. (graduation principle); HUDEC, supra note 351, at 85-86 (reporting successful state action under this principle).

359. See Reichman, GATT Connection, supra note 8, at 816-22, 864-69.

360. See, e.g., Draft Understanding on Disputes, supra note 17, arts. 11, 12, 21; see also Judith H. Bello and Alan F. Holmer, GATT Dispute Settlement Agreement: Internationalization or Elimination of Section 301?, 26 Int’l Law. 795, 800-01 (1992) (advocating continued but selective use of unilateral sanctions even after the conclusion of Uruguay Round); Theodore H. Davis, Jr., Combating Piracy of Intellectual Property in International Markets: A Proposed Modification of the Special 301 Action, 24 VAND. J. TRANSNAT’L L. 505 (1991). For evidence that the U.S. intends vigorously to pursue unilateral pressures prior to the successful conclusion of a TRIPS Agreement, see Shapiro Tells Panel [Clinton] Administration Will Give ‘Special 301’ Fresh Direction, 10 INT’L TRADE REP. 648-49 (1993).

361. See, e.g., Hudec, supra note 334, at 199.
trade-distorting over time.\textsuperscript{362}

To this end, the developing countries can take persuasive defensive measures of their own if circumstances so require. The very existence of a TRIPS agreement, for example, gives them a degree of leverage they often lacked before in that the industrialized countries will obtain privileges and benefits they would be reluctant to forfeit in some future conflict.\textsuperscript{363} If developed countries depart from the principle of strengthening the system through multilateral negotiations, developing countries may retaliate by threatening to withdraw intellectual property rights conceded in the Uruguay Round, not to mention cross-retaliatory options to which they also become legally entitled. At the limit, developed countries that press too hard should be prepared to see the developing countries form a countervailing intellectual property “union” of their own, once efforts to obtain a balanced compromise within the GATT framework broke down or reached an unacceptable impasse.\textsuperscript{364}

\textbf{B. The Competitive Ethos in a Global Economy}

The integration of intellectual property into international economic law will require entrepreneurs in both developed and developing countries to reevaluate the nature of competition in a more regulated global marketplace. While strengthened intellectual property norms benefit inventors and creators everywhere, there is no assurance that any particular countries will succeed in transforming short-term trade advantages accruing from a TRIPS agreement into solid and lasting commercial benefits. On the contrary, stronger intellectual property laws will ultimately benefit those states whose long-term development strategies best promote sustained technological innovation and the effective transfer of basic research from universities and laboratories to industry.\textsuperscript{365} The future prospects of the developed countries, including the United States, turn less on the level of intellectual property protection as such than on the

\textsuperscript{362} See, e.g., Mody, \textit{supra} note 71, at 225; Reichman, \textit{Electronic Information Tools}, \textit{supra} note 191, at 455-61, 468-75; see generally 1 LADAS, \textit{supra} note 152, at 15-18 (depicting harmonization as the product of a slow and gradual process).

\textsuperscript{363} See, e.g., Cottier, \textit{supra} note 33, at 394.

\textsuperscript{364} See, e.g., Reichman, \textit{GATT Connection}, \textit{supra} note 8, at 890-91.

\textsuperscript{365} Cf., e.g., Reichman, \textit{Overlapping Proprietary Rights}, \textit{supra} note 102, at 87-110.
level of investment in basic research and in high-risk commercial applications of the products it generates.

By the same token, the prospects for strengthened intellectual property regimes operating in open markets will require developing countries to formulate economic development strategies that are consistent with the new legal order. To maximize their opportunities, developing-country authorities must foster and reward entrepreneurship in general, while entrepreneurs in developing countries must learn to think like small- and medium-sized firms in the industrialized countries. In time, affinities between small- and medium-sized firms in both developed and developing countries will outweigh the affinities between small and large firms operating within any given national territory, and this transnational commonality of interests should strengthen the role of developing countries in future multilateral negotiations. Meanwhile, the developing countries will have to work harder to compete in general, and to acquire technological improvements in particular, under a post-TRIPS regime. However, if the appropriate strategies are adopted in both the public and private sectors, any competitive efforts that yield a foothold in the world market, and any effective transfer of technology achieved in the process, should yield greater potential returns than at present.366

In all countries, efforts to implement higher intellectual property standards will put increasing strains on competition law, which is not directly covered by the TRIPS Agreement. Identifying the parameters of healthy competition valid for all players in an integrated world market will thus become a pressing task for the international community in a post-TRIPS economic environment.367 Because innovators, users, and second comers all have different stakes in fashioning the rules of unfair competition law, their inter-

366. See also Reichman, supra note 24.
ests will increasingly vary more with their economic roles than with the geopolitical affiliations of their respective national states. Developed countries that too aggressively promote the demands of large, multinational corporations risk producing a competitive environment inimical to the needs of their own small- and medium-sized entrepreneurs. Developing countries that overly regulate large foreign firms operating in their territories run the risk of suffocating their own small- and medium-sized firms.

Competition law must, accordingly, remain an integral part of ongoing international discussions of intellectual property rights. In this context, developed countries must eventually take steps to protect applied scientific know-how, which largely escapes the patent and copyright systems, and they will continue to press the developing countries to limit the pace at which second comers can appropriate the fruits of investment in unpatented, noncopyrightable innovation. At the same time, the developing countries will require the cooperation of the industrialized countries in formulating guidelines for the licensing of both patented and unpatented technologies in order to effectuate transfers of technology without unduly discouraging direct foreign investment. If, in future negotiations, the developing countries proved willing to exchange greater short-term protection of products embodying unpatented know-how for a commitment by the industrialized countries to support an international Code of Conduct on the Transfer of Technology, it might open a new chapter in international unfair competition law.

Clearly, there is a great need for multilateral coordination and cooperation to ensure that all voices are heard in a collective endeavor to achieve a market-wide balance between incentives to create and reasonable opportunities to imitate and improve upon technological innovation. Future discussions seeking to reconcile

368. See, e.g., Cottier, supra note 33, at 410.
369. See supra text accompanying notes 260-65; see generally Reichman, Legal Hybrids, supra note 114.
370. See supra text accompanying notes 169-72, 266-71; see also Experts Report on UNCTAD’s Draft Code of Conduct, supra note 143.
371. Cf. Reichman, GATT Connection, supra note 8, at 870-72, 875-78.
the need for more effective transfers of technology with the drive for greater economic efficiency will require a high level of technical expertise and a nonconfrontational environment conducive to reasoned economic and social analysis. To the extent that cooperation between developed and developing countries succeeds, it will contribute a new perspective to the notion of fair competition that should strengthen the prospects of all participants in the global marketplace of the twenty-first century.