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Law as a Network Standard

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GLOBAL INFORMATION FLOWS are reshaping the international information landscape, channeled from nation to nation through the new outlets provided by global computer networks. Such movement of information between jurisdictions invites conflicting applications of local regulations over advertising, intellectual property, hate speech, personal data, and other communicative content. Understanding the role of the Internet in this context is crucial to understanding the phenomenon of transborder information exchanges, as the Internet both forms an active conduit for much of this information flow and provides a case study for understanding information flows outside the network.

To a greater extent than any previous communications medium, the Internet facilitates the interconnection of potentially incompatible law regimes. The natural response to such incompatibility is to seek harmonization or centralization of legal standards at a supranational level. The case for harmonization or centralization of regulation at the international level is in many instances compelling; however, enthusiasm for an international regulatory approach must be tempered by caution over the potential costs and drawbacks of centralized hierarchical control. Improperly applied, international Internet regulation threatens to mitigate the very benefits that make the network most valuable and could in fact negate the very benefits that the regulation is intended to preserve.

The cure may therefore be as bad as the disease; at a minimum, it carries with it a variety of troublesome results. In this chapter, I briefly discuss two related cautionary models implicated in the argument for international regulation. I argue that Internet regulation at an international level may be conceived as a standards-setting problem, presenting at a multinational level the same dangers and benefits of uniformity, competition, and strategic behavior familiar from analyses of technical standards-setting. This approach arises in turn from the conceptualization of law as a product, and from the potential for interchanging law and technology as regulatory methods.

I begin by reviewing the literature analyzing law as a product; I then extend the basic concepts of that model to discuss implications of international regulation in light of network effects in the market for law. I conclude that these models point to only a limited and particularized case for international regulation in order to preserve the benefits of decentralized innovation in law. Consequently, in any given instance, the case for harmonized international regulation must be evaluated according to its potential for curtailing the competitive benefits of localized regulatory innovation.

Law as a Product

The problem of transborder data regulation implicates economic models previously developed to analyze interjurisdictional competition. In 1956 Charles Tiebout published his now-classic paper modeling local provision of public services on a theory of interjurisdictional competition that closely resembles market competition for provision of private goods.[1] Tiebout theorized that if citizens are free to migrate between jurisdictions, competition for desirable citizen immigrants will arise. Local communities will offer to potential immigrants the most attractive packages of goods and services at the lowest tax rate possible. Similarly, migrants will relocate to jurisdictions offering the maximum package of public goods at the tax rate that the migrant is willing to pay. Local communities may even tailor their offerings to appeal to particular types of immigrants, and immigrants would be expected to sort themselves out into groups of similar means and tastes by jurisdiction.

Under Tiebout's approach, the production of local public goods and services might resemble the production of private goods in a competitive market: Competitive pressure from other jurisdictions will prevent any given jurisdiction from offering too much or too little in the way of public services.[2] Jurisdictions that offer too much will experience an influx of immigrants from less generous jurisdictions; jurisdictions that offer too little will experience an exodus to more generous jurisdictions. Migration in or out of the jurisdiction will continue until parity with competing jurisdictions is reached.[3] These forces therefore act as a check on overproduction or underproduction of local public goods. By "voting with their feet," or exiting, citizens force efficiency in allocation of resources to such goods.

Tiebout's insight was quickly expanded to encompass strategic preferences of local governments regarding business firms. Just as in the consumer/citizen model, businesses too may "vote with their feet," locating their operations in jurisdictions that offer the most attractive set of local public goods. This in turn implies that jurisdictions may tailor their offerings to attract businesses, or to attract certain kinds of desirable businesses, or even to repel undesirable businesses.[4] In this "market" for business migration, the "price" of migration may take a variety of forms: Jurisdictions may offer anything from tax incentives, land grants, and liability waivers to museums, sports arenas, and public transportation systems.[5] Some jurisdictions will have raw materials or other natural competitive advantages to attract business; others will create attractive public infrastructures that give them an advantage.

Local law constitutes an important component of each jurisdiction's competitive package. Regulation with economic effects may be tailored to foster and to attract certain industries. For example, environmental regulations may be eased in order to lower the operating costs of favored industries. Patent and copyright laws may be strengthened in order to maximize the economic return to industries that generate new innovation. Corporate and partnership laws may be designed to accommodate investment and control structures amenable to certain industries. Indeed, development of desirable law "products" may be even more important to attract and retain high-value businesses than it is to attract and retain high-value individuals.

This model therefore implies that competition for business and for desirable immigrants will prompt jurisdictions to compete with one another to offer the most attractive law "products"—in effect, creating a market for law. Optimally, such competition will tend not only toward the production of law that is differentiated to suit certain business profiles but also to produce better and more efficient regulation; the threat of losing businesses to another jurisdiction will tend to weed out the inefficient legal regimes—a "race to the top," to the optimal package of law. However, it is also possible for this "race to the top" to become a "race to the bottom." The Tiebout model assumes that jurisdictions are tightly compartmentalized so that no external costs or benefits accrue from the local provision of public services.[6] If jurisdictions are "leaky," then individuals could perhaps enjoy the positive benefits of a neighboring jurisdiction's policy without actually incurring the cost of migrating to it. More significantly, in a world of "leaky" borders, jurisdictions could lower the costs to local firms by imposing all or part of those costs on neighboring jurisdictions, for example by relaxing environmental regulation to allow effluent dumping into a river that flows into a neighboring country. This would serve to attract firms, but not necessarily by generating a net gain in efficiency.

Consequently, in a world of "leaky" borders, the race to the bottom might best be characterized as a race to externalize—for jurisdictions to seek ways to gain at the expense of their neighbors. Because the externalized costs of such local regulation are imposed upon others, jurisdictions will tend to overspend on law "products," offering immigration incentives for which they themselves need not pay. The Internet, of course, is a source of transborder leakiness, at least for digitized products and for data migration. This raises the concern that that the Internet may trigger such races to externalize costs, providing a conduit for local costs to be imposed upon other jurisdictions.

Thus, to take an example that has been hotly debated in the jurisprudence of the Internet, one possible characterization of the peer-to-peer music file-sharing phenomenon—whereby digitized music, software, and sometimes movies are shared via the Napster, Kazaa, or other online services—is one that suggests a race to the bottom. Much of the supply of such files comes out of jurisdictions with lax copyright law or lax copy-

right enforcement. Indeed, businesses supplying software for such file sharing have taken advantage of the attractive incorporation of law and legal immunity provided by small and somewhat obscure jurisdictions such as the Pacific island of Vanuatu. Lurking in permissive jurisdictions, these entities free-ride off of the creativity fostered in protective jurisdictions, using the Internet as a conduit to bleed legitimate incentives away from the owners and producers of valuable creative works.

But in branding such a scenario an inefficient "race to the bottom," we must exercise care. Early analyses of incorporation races among jurisdictions in the United States branded this race a "race to the bottom," a race to benefit corporate officers at the expense of shareholders. Later, more careful analyses suggested that it may in fact have been a "race to the top," a competition among jurisdictions to produce the best package of corporate law "products."[7] In the making of such characterizations, the perspective adopted may dictate the conclusion.

Thus, in our peer-to-peer file-sharing example, a rather different story might be told on the same facts: In this version, offshore encouragement of peer-to-peer entrepreneurship becomes a race to the top, forcing a bloated and complacent U.S. entertainment industry to revise its outmoded business models. On this view, consumer adoption of digital technology has outstripped the recording labels' sluggish pace of change, creating a gap between consumer demand and the dated products provided by entertainment firms. Peer-to-peer entrepreneurship filled that gap, providing not only innovative distributional services but also models for traditional entertainment firms to emulate. Without the harsh market discipline of file sharing, the authorized music downloading services that are now beginning to cater to consumer demand might never have been launched.

Law Cartels

Where borders leak, undesirable transborder migrations might be curtailed by equalizing the benefits on each side of the border. Jurisdictions might agree to set a uniform standard for their law products, removing the incentive to race to the top or to the bottom. Then, much like a classic private-sector economic cartel, governments that participate in an international agreement may be able to avoid "ruinous competition" in

the market for law as a good. By standardizing the law product, they may succeed in effectively fixing the "price" for business migration.

Taking copyright as an example in the Internet context, enforcement of high protectionist standards would prevent cartel nations from lowering their "price" to attract information distributors—that is, so-called pirates. Fixing the price for information distributor migration would in turn allow domestic producers to avoid foreign information competition and engage in monopoly overcharge for information products. On an international scale, this type of monopoly overcharge effectively taxes nonproducing nations—particularly developing nations—to support the information producers of the developed world.

Such collusive international activity may be highly advantageous to politicians at the national level. First, through collusion with foreign politicians, domestic politicians can protect themselves against superior foreign law products. Exodus of firms to more attractive regulatory regimes may place domestic politicians under pressure to streamline local regulation, perhaps at the expense of favored but inefficient rent-seeking constituents. Such streamlining may, however, be avoided by agreement with foreign counterparts to cooperate in suppressing formulation of more efficient regulation in their respective jurisdictions.

At the same time, local politicians may use an international agreement to deflect domestic voter dissatisfaction over domestic special interest legislation, by characterizing the local protectionist measures as a necessary part of international cooperation. This in essence facilitates *intra*-jurisdictional externalization of regulatory costs: Rather than shifting costs to other jurisdictions, costs are shifted to a different constituency within the jurisdiction. Thus, international collusion may not only prevent "exit" from correcting political improvidence but may also suppress the "voice" of internal constituents from prompting correction.

Returning to our example of peer-to-peer technology, we might query whether the active campaign for increased intellectual property protection in the face of widespread file sharing fits this model. Indeed, this characterization suggests that the fierce lobbying and advocacy campaigns waged by the entertainment industries have merely been rent-seeking attempts to preserve their current business positions by legislative fiat, which often may be had for a small investment in lobby-

ing activity—cheaper than making the sizeable investment necessary to restructure their outmoded business models. If this characterization is correct, elevating the results of such lobbying efforts to the international level only encourages socially inefficient behavior by removing the possibility of more efficient extraterritorial competition.

However, the success of national protectionists, or any other group of price-fixers, requires a stable cartel, and cartels of any sort are notoriously unstable.[8] Such instability results in part from a sort of "Prisoner's Dilemma" version of the "race to the bottom" effect. Cartels extract monopoly profits by agreeing to restrain output so as to push prices to levels that would be impossible to maintain if the members engaged in production at competitive levels. Cartel members therefore have a strong incentive to cheat: If a cartel member engages at competitive-level production while competitors restrain output, the cheater can reap enormous profits. But because all members of the cartel are tempted by this same possibility, one member is unlikely to be able to cheat without triggering cheating by all the other members, leading back to competitive pricing and loss of the profits that prompted the cheating.

In the case of private economic cartels, a collusive organization is believed to be most feasible and stable where the quality of the product is homogeneous, the price elasticity of demand for the product is low, barriers to entry are high, all suppliers of the product have similar cost functions, and there is a dominant supplier who can act as price-leader. In the case of international collusion over Internet law "products," several of these requirements may be met by the configuration of participation in law production.

First, it would appear that the universe of law producers on an international scale is largely closed, forming something of a barrier to entry. Price-leadership or "dominant firm" effects may also be seen in the market for law products. The number of sovereign states is relatively large, but certain nations, particularly the United States, are able to exert considerable diplomatic and economic pressure toward conformity.[9] By promulgating its copyright and patent law products as a proposed standard for inclusion within the Berne treaty revisions, or TRIPs trade agreements, the United States has rather successfully attempted to coordinate the international market for such law products. The European Union has

taken much the same approach in promulgating its standards for data privacy protection and proprietary database protection.

If the conditions for a stable intergovernmental cartel can be attained, the expected damage to innovation and competition will follow naturally from the principles outlined in the literature on law as a product. First, by homogenizing information law, an international agreement forces international businesses to operate in a world in which "one size fits all." Opportunities for jurisdictional experimentation and innovation are curtailed. New information industries that might have arisen under innovative schemes may be stifled. Established information industries will be confined to an international norm, rather than offered the opportunity to select, from a diversity of systems, that which is best suited to their operation. As a corollary effect, information firms will be exposed to greater business risk because they will be less able to diversify their operations across jurisdictions with differing legal systems. Thus, one reason to approach centralization with caution is that the international inefficiencies resulting from an international intellectual property cartel may be no less serious than the inefficiencies resulting from lack of coordination.

Law as a Standard

Conceptualizing the centralization of Internet law as international cartel activity in the market for law implicates another set of economic models related to the issue of standards-setting for technical compatibility. "Standards" in this context may be defined as a set of technical specifications that provides common design features for a product or process.[10] The potential benefits of uniform technical standards, and the problems attending incompatible standards, are common knowledge.[11] As any traveler carrying an electrical appliance has discovered, the costs of non-uniform technical standards can be profound: Voltage, current, and even physical plug configuration vary enormously among different regions, requiring either expensive duplication of locally compatible appliances or a panoply of adapters and transformers allowing a noncompatible appliance to function locally. Coordination of technical design, even among competitors, is often necessary to avoid the costs and inconvenience associated with such technical incompatibility. This design coordination is known as standards-setting.

This standards-setting problem occurs as a consequence of what economists term "network effects." Such network effects typically arise in situations where the value of a system increases as users are added.[12] Purchasers of such "network" goods find the good increasingly valuable as others also purchase the good. Typically, the increased value accrues to subsequent adopters and accrues as a positive externality. For example, a telephone system is of relatively little value if it has only two subscribers; each subscriber can call only one other person. The system is of greater value if it has more subscribers, because each subscriber can then communicate with many others. Those who subscribe to the system after it has accrued a large number of subscribers may obtain a more valuable service than those who subscribed early, when there were few other subscribers. At the same time, the value of the service to the early subscribers grows as additional users sign on to the network.

This insight can be generalized to other types of human artifacts with shared compatibility: Languages, for example, may be thought of as goods having network effects. The ability to "interoperate" internationally with a wide diversity of individuals is illustrated by the benefits of speaking Greek in the ancient Western world, Latin in the medieval Western world, French or Spanish in the European colonial era, or English in the current global era. As another common example, many commentators have noted that computer operating systems tend toward a uniform standard because of the natural benefits of a uniform standard: Users need invest in learning the characteristics of the system only once, technical support for a single standard is simple to provide, and producers of compatible software applications need develop products to function with only a single platform.

The Internet itself, not surprisingly, is a prime candidate for display of such network externalities: Network access becomes more valuable as it becomes ubiquitous.[13] Much of the success of the Internet itself is due to the creation of a new type of physical network: The internetworking protocols on which the Internet operates allow disparate types of computer hardware, running many different software systems, to interact on a single network. This is the so-called "end-to-end" principle, under which the network is designed to constitute a simple and unspecialized common technological denominator. Thus, users with previously incompat-

ible equipment can now join the same system and interoperate.[14] Additionally, any given application run on the network may show a different kind of network effect from usage: E-mail, for example, is a more valuable service if it can be used more widely. Similarly, the World Wide Web becomes more valuable as it accumulates more reference linkages, allowing more information to be indexed and accessed.

Both types of network activities are simultaneously possible because the Internet exhibits more than one type of network effect, a point that may require some brief explanation. Katz and Shapiro have distinguished between actual and virtual networks.[15] Actual networks may be characterized as those that physically interoperate with one another, virtual networks as those that have common features without direct interoperation. To the extent that the Internet generates benefits to users by having their machines physically connected to the network, allowing interaction between users, it represents an actual network. Simultaneously, the benefits accruing from similarity of software platforms or, for that matter, from the content on the system, constitute a virtual network of shared compatibility. By providing a common technical standard, the Internet generates both types of beneficial effects.

The creation of a common standard is often beneficial, and indeed may be critically important, where network efficiencies can be realized. At the same time, the potential downside of any standards-setting process is profound.[16] Networks may also produce negative effects, as the cost of leaving the network, even when it would be socially desirable to do so, may be prohibitively high. The likelihood of "lock-in" to an inefficient standard remains a disputed but nonetheless serious consideration.[17] The concern in such situations is that once a standard is adopted, network effects may raise the cost of changing to a newer or better alternative, causing the standard to become permanently entrenched. This may possibly occur where the short-term costs of switching away from the old standard are greater than the long-term benefits of the new standard—indeed, it has been argued that development of new standards may be deterred if network effects raise the short-term cost of development and deployment is above the perceived savings of a new standard.

As a consequence, the development of standards carries potential risks to competition, related to the potential negative consequences of net-

work effects. Eventually, the prevailing standards in a networked industry might be displaced by the promulgation of new or better standards, but there is a serious danger of anticompetitive manipulation of the standards-setting process, or of the standard itself, to achieve some form of market dominance.[18] Standards-setting organizations, for example, may sometimes cloak anticompetitive cartel-like activity if their membership is limited and conditions permit them to control adoption of the standard.[19] Either within or without an organizational setting, a dominant industry player may be able to arrange "tipping" of the market toward a desired standard—presumably, toward a proprietary standard that can be controlled or exploited by that producer. Network effects may be manipulated in these situations to "lock" users in to the standard, frustrating new entry or technological improvement.

Legal Standards-Setting

As an international network, the Internet presents issues related not only to the actual compatibility of technical products but also to the virtual compatibility of *legal* products.[20] Like language or interoperable computer systems, law may also be characterized as a system with network effects, displaying the same standardization issues familiar from analysis of technological standards. Legal harmonization facilitates a virtual network of compatible legal standards. Efficiencies may be realized when interjurisdictional legal standards are adopted, just as they may be when interjurisdictional electrical or telecommunications standards are adopted. Such legal compatibility allows individuals and entities to invest once in learning the legal system, then apply that investment across multiple jurisdictions.

Indeed, it might be said that law interoperates with law from other jurisdictions, particularly as capital, goods, and individuals interact or move across borders; such movements or transactions may be simultaneously subject to the legal standards of multiple jurisdictions, creating a potential for incompatible standards to impose conflicting demands on the interjurisdictional actor. Where legal standards differ, or are incompatible, compliance with applicable law becomes expensive and uncertain. These uncertainties have long been a focus of concern for Inter-

net-related activities, although this type of interaction is not unique to Internet activity.[21] Individuals who travel are frequently confronted not only with unusual and incompatible electrical outlet configurations but also with unusual and sometimes incompatible legal requirements. Businesses that operate in more than one country must similarly cope with the legal demands of multiple jurisdictions. Indeed, large bodies of adaptive jurisprudence have grown up around routinely encountered questions of jurisdiction and choice of law conflicts—what to do when a traveler from one country commits a crime in another country's territory, or when an industrial activity in one country causes harm in a different country. Such "meta" legal rules designate which law should govern when multiple, conflicting sets of laws could be applied to an interjurisdictional situation.

The Internet greatly facilitates such interjurisdictional interaction, connecting individuals and institutions from differing legal systems and raising the level of virtual movement between regimes. Perhaps more important, the low costs of accessing the network also make such interactions relatively cheap, placing them within the purview of small businesses and average citizens—no longer are transnational interactions relegated to a relatively few highly capitalized transnational firms. However, this new, cheap access to worldwide communications also means that interjurisdictional conflicts may now become commonplace to those who are least likely to have expertise or skill in negotiating inconsistent legal regimes. Negotiating these complex systems of "meta" legal rules is a daunting task even to those knowledgeable in their intricacies, and a nearly impossible proposition to the average person or business entrepreneur. In such circumstances, the existing framework for conflicts of law may not "scale" well—the byzantine, costly legal rules developed for pre-Internet interactions may be too unwieldy to apply to the ubiquitous interjurisdictional interactions the Internet has created.[22]

The problem of transborder conflicts occasioned by the Internet may therefore be characterized as a difference of scale, rather than of type—conflicts simply happen more frequently because connections to the global computer network have become widespread. But the Internet also reveals an additional dimension of interjurisdictional conflicts analysis that may have gone previously unrecognized.[23] The rise of Internet-based

"virtual" interactions dramatically illustrates the interconnection of legal and technical networks and implies that law interoperates with technology. The interconnected technological system of the network may be considered an extension of the legal systems arrayed at the periphery of the net. Essentially, the Internet concatenates the legal regimes it touches into a single, seamless network of social interactions.

Thus, the technological system of the network in essence provides a common standard for interjurisdictional interoperation of diverse legal systems. Yet it must be understood that just as the technical network is agnostic toward the applications, platforms, or devices arrayed at its periphery, so too is it indifferent to the legal networks that it interconnects. The open architecture and "end-to-end" design of the network may connect devices with otherwise incompatible operating systems, or it may connect jurisdictions with otherwise incompatible legal systems: Whether it is Unix-based machines interoperating with Windows-based machines or protectionist-based copyright interoperating with access-based copyright, the network treats them all the same. As a result, the network may bridge legal systems with radically different goals and expectations.

Indeed, most of the legal controversies surrounding the Internet may be characterized as arising out of this interconnection of incompatible legal systems, not unlike the problem faced by a traveler attempting to plug into a foreign electrical grid an appliance not intended for the local voltage or socket configuration.[24] A variety of Internet-related controversies have erupted over online activity ranging from the promulgation of pornographic materials to the sharing of software or music files. The design of the network, lacking the natural impediments intrinsic to traditional media, actually facilitates the distribution of problematic information. In some cases, local reaction has centered on such technological solutions as software filters or technological controls. In other cases, the reaction has been to amend or extend legal sanctions for the offending activity or to implement some combination of legal and technical prohibitions. These responses to electronic dissemination of pornography, or of private information, or of copyrighted works, are essentially attempts to either legally or technically retrofit the network to comply with the local legal regime.

Retrofitting the network to local standards via technological or cultural add-ons therefore attempts to adapt a foreign standard to interop-

erate with local systems, much as the traveler may attempt to retrofit a nonconforming device to local voltage, current, and plug configuration by means of adapters and transformers. As with electrical adapters and transformers, the cost of such inconvenience could be lowered, and a variety of other efficiencies realized, by establishing a single international standard for international legal interoperation, or at least interoperation facilitated via the Internet. On this view, the "harmonization" process for international Internet law essentially constitutes a standards-setting process, establishing uniform legal standards across multiple jurisdictions.

But while this approach offers the benefits of standardization, it carries with it the same dangers indicated previously: There may be serious long-term costs if Internet law becomes "locked" into a single standard, particularly if dominant nations act strategically in establishing that standard. As in the case of technical standards, standardized law raises a real danger that a dominant standard will suppress competition and entry into the market for law products. Just as firms may behave strategically in the technical standards-setting process, nations may well behave strategically in the legal standards-setting process. There is already some evidence that this is occurring in international harmonization regarding privacy and intellectual property, where the United States and the European Union have, respectively, largely eliminated any competing regulatory systems.[25] While the international information law regime may benefit in the short run from the uniformity engineered by the U.S. and EU dominance in these areas, there is little opportunity for displacement of these regimes by newer, possibly more innovative approaches. In this environment, such dominant law producers may well monopolize the market for Internet law for the foreseeable future.

Conclusion

I have suggested here that the costs and benefits of internationalizing Internet law can be evaluated by adapting models drawn from the economic analysis of cartel theory and standards-setting, as law may be considered not only a product but also a standard. The equation of law with interoperable technical standards should hardly come as a surprise. Students of technological meaning have long held that technology comprises reified norms.[26] At the same time, law is largely the

formal statement of those norms.[27] The normative meanings of these two cultural artifacts interact in a complex relationship, both reshaping and reinforcing one another. More recently, legal scholars including Reidenberg and Lessig have suggested and extensively explored the interchangeability of law and of technological constraints in achieving social policy objectives.[28] This conceptualization of law is in some sense the logical endpoint of the economic approach conceiving law as a product: If law is an economic good that competes with similar goods from other producers, so too is law a product that interoperates with similar products from other producers, as well as with other systems of complementary or competing products, even if they take the form of technological standards.

Notes

1. Charles Tiebout, *A Pure Theory of Local Expenditures*, 64 J. POL. ECON. 416 (1954).

2. *See* Joseph Stiglitz, *The Theory of Local Public Goods in* LOCAL PROVISION OF PUBLIC SERVICES: THE TIEBOUT MODEL AFTER TWENTY-FIVE YEARS 17, 18 (George R. Zodrow ed. 1983).

3. *See* George J. Stigler, *Economic Competition and Political Competition*, 13 PUB. CHOICE 91, 93 (1972).

4. Susan Rose-Ackerman, Does Federalism Matter? Political Choice in a Federal Republic, 89 J. POL. ECON. 152, 157 (1981).

5. *See* Albert Breton, *The Existence and Stability of Interjurisdictional Competition in* COMPETITION AMONG STATES AND LOCAL GOVERNMENTS: EFFICIENCY AND EQUITY IN AMERICAN FEDERALISM 37, 42 (Daphne A. Kenyon & John Kincaid eds. 1991).

6. Robert P. Inman and Daniel L. Rubinfeld, *The Political Economy of Federalism in* PERSPECTIVES ON PUBLIC CHOICE: A HANDBOOK 71, 83 (Dennis C. Mueller, ed. 1997).

7. *See* Roberta Romano, THE GENIUS OF AMERICAN CORPORATE LAW 5–6 (1993).

8. *See* George J. Stigler, *A Theory of Oligopoly*, 72 J. POL. ECONOMY 44 (1977).

9. Marci A. Hamilton, *The TRIPS Agreement: Imperialistic, Outdated, and Overprotective*, 29 VAND. J. TRANSNAT'L L. 613, 615–16 (1996).

10. 2 HERBERT HOVENKAMP ET AL., IP AND ANTITRUST: AN ANALYSIS OF ANTITRUST PRINCIPLES APPLIED TO INTELLECTUAL PROPERTY LAW § 35.1 at 35–3 (2002).

11. *See* Carl Shapiro and Hal R. Varian, INFORMATION RULES 229 (1999).

12. *See* Michael L. Katz and Carl Shapiro, *Network Externalities, Competition, and Compatibility*, 75 AM. ECON. REV. 424 (1985).

13. *See* Mark A. Lemley and David McGowan, *Legal Implications of Network Economic Effects*, 86 CAL. L. REV. 479, 551 (1998).

14. *See* Mark A. Lemley and Lawrence Lessig, The End of End-to-End: Preserving the Architecture of the Internet in the Broadband Era, 48 UCLA Law Review 925 (2001).

15. *See* Michael L. Katz and Carl Shapiro, *Systems Competition and Network Effects*, 8 J. ECON PERSP. 93, 95 (1994).

16. *See* Carl Shapiro, *Setting Compatability Standards: Cooperation or Collusion*, in EXPANDING THE BOUNDARIES OF INTELLECTUAL PROPERTY: INNOVATION POLICY FOR THE KNOWLEDGE SOCIETY 81, 88 (Rochelle Cooper Dreyfuss et al. eds., 2001).

17. *See* S. J. Leibowitz and Stephen E. Margolis, *The Fable of the Keys*, 33 J.L. & ECON. 1 (1990).

18. *See* Stanley M. Besen and Joseph Farrell, *Choosing How to Compete: Strategies & Tactics in Standardization*, 8 J. ECON. PERSP. 117 (1994).

19. *See* Mark A. Lemley, Intellectual Property Rights and Standard-Setting Organizations, 90 CAL. L. REV. 1889 (2002).

20. *See* Margaret Jane Radin, Online Standardization and the Integration of Text and Machine, 70 FORDHAM L. REV. 1125 (2002).

21. *See* Jack Goldsmith, *Against Cyberanarchy*, 65 U. CHI. L. REV. 1199 (1998).

22. *See* Dan L. Burk, *Federalism in Cyberspace Revisited* in WHO RULES THE NET? INTERNET GOVERNANCE AND JURISDICTION 119 (Adam Theirer & Wayne Crews, eds. 2003).

23. *Cf.* Lawrence Lessig, *The Law of the Horse: What Cyberlaw Might Teach*, 113 HARV. L. REV. 501 (1999).

24. *See* Dan L. Burk, *Cyberlaw and the Norms of Science*, 1999 B.C. INT. PROP. & TECH. F. (June 4, 1999) http://infoeagle.bc.edu/bc_org/avp/law/st_org/iptf/commentary/content/burk.html.

25. *See* Dan L. Burk, *Privacy and Property in the Global Datasphere: International Dominance of Off-the-shelf Models for Information Control* in PROCEEDINGS OF THE FOURTH INTERNATIONAL CONFERENCE ON CULTURAL ATTITUDES TOWARD TECHNOLOGY AND COMMUNICTION 363 (Fay Sudaweeks & Charles Ess, eds., 2004).

26. Bruno Latour, *Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts*, in SHAPING TECHNOLOGY/BUILDING SOCIETY: STUDIES IN SOCIOTECHNICAL CHANGE 225, 244 (Weibe E. Bijker & John Law, eds., 1992).

27. *See* Eric A. Posner, LAW AND SOCIAL NORMS (2002).

28. Lawrence Lessig, CODE AND OTHER LAWS OF CYBERSPACE (1999); Joel Reidenberg, *Lex Informatica: The Formulation of Information Policy Rules Through Technology*, 76 TEX. L. REV. 553 (1998).