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ENGINEERING A DEAL: TOWARD A PRIVATE ORDERING SOLUTION TO THE ANTICOMMONS PROBLEM

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Abstract: The problems of the intellectual property (“IP”) anticommons are infamous. Many people fear that the potential for vast numbers of IP rights to cover a single good or service will prevent an enterprise from even attempting to launch a business for fear of being unduly taxed or retarded or simply held up. This Article offers a solution based on private ordering within the context of existing laws. This approach uses a limited liability entity structured so that IP owners are given an actual stake in the operating business and thus an incentive to participate in the enterprise; and yet at the same time, the IP owners face a number of constraints that mitigate their interest in acting opportunistically by holding out. Through careful attention to IP owner payoffs and self-restraint, the proposed structure is designed to coordinate behavior among relevant IP owners, thus overcoming the anticommons problem. This approach is designed to help lawyers serve their role as transaction cost engineers who can structure relationships in ways that get deals done.

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INTRODUCTION

A recent explosion in the IP literature focuses on a set of problems relating to an arrangement of property rights called an "anticommons."¹ The basic distinguishing feature of the IP anticommons is the existence of such a large number of IP rights covering a single good or service that the provision of that good or service is feared to be unduly taxed and retarded, if not outright prevented.²

An often-discussed example of the anticommons problem is DNA-on-a-chip technology involving micro-arrays of thousands, or even tens of thousands, of individual pieces of DNA. Each piece of DNA may be covered by a different patent; and many of the patents may have different owners.³ It is feared that entering a business based on such a chip would require the business owner to identify, find, and then successfully transact with a staggering number of individual IP owners. Such transaction costs, combined with the risk that any one of

¹ See, e.g., Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCIENCE 698 *passim* (1998) (introducing the term "anticommons" to IP); Michael A. Heller, *The Tragedy of the Anticommons: Property in the Transition from Marx to Markets*, 111 HARV. L. REV. 621, 623-24 (1998) (defining anticommons property generally). A separate body of work has explored the ways in which IP can be seen as a "semi-commons." See generally Robert A. Heverly, *The Information Semi-Commons*, 18 BERKELEY TECH. L.J. 1127 (2003); Henry E. Smith, *Governing the Tele-Semicommons*, 22 YALE J. ON REG. 289 (2005); Henry E. Smith, *Semicommon Property Rights and Scattering in the Open Fields*, 29 J. LEGAL STUD. 131 (2000); Greg R. Vetter, *Open Source Licensing and Scattering Opportunism in Software Standards*, 48 B.C. L. REV. 225 (2007); Henry E. Smith, *Intellectual Property: An Information Cost Approach* (Feb. 7, 2004) (unpublished manuscript, on file with authors).

² See Michael A. Heller, *The Dynamic Analytics of Property Law*, 2 THEORETICAL INQUIRIES L. 79, 87-89 (2001) (providing a detailed description of the term as it applies to IP).

³ See Heller & Eisenberg, *supra* note 1, at 699; Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 863-66, 875 (1990) (discussing the general possibility of patents blocking downstream work); Suzanne Scotchmer, *Standing on the Shoulders of Giants: Cumulative Research and the Patent Law*, 5 J. ECON. PERSP. 29, 30-32 (1991) (same). For examples of recent governmental reports expressing the same concerns, see COMM'N ON INTELLECTUAL PROP. RIGHTS, INNOVATION & PUB. HEALTH, WORLD HEALTH ORG., *PUBLIC HEALTH INNOVATION AND INTELLECTUAL PROPERTY RIGHTS* (2006), available at <http://www.who.int/intellectualproperty/documents/thereport/ENPublicHealthReport.pdf>; COMM. ON INTELLECTUAL PROP. RIGHTS IN GENOMIC & PROTEIN RESEARCH & INNOVATION, NAT'L RESEARCH COUNCIL, *REAPING THE BENEFITS OF GENOMIC AND PROTEOMIC RESEARCH: INTELLECTUAL PROPERTY RIGHTS, INNOVATION, AND PUBLIC HEALTH* (2005), available at http://fermat.nap.edu/openbook.php?record_id=11487&page=R1; FTC, *TO PROMOTE INNOVATION: THE PROPER BALANCE OF COMPETITION AND PATENT LAW AND POLICY* (2003), available at <http://www.ftc.gov/os/2003/10/innovationrpt.pdf>; WORLD HEALTH ORG., *GENETICS, GENOMICS AND THE PATENTING OF DNA: REVIEW OF POTENTIAL IMPLICATIONS FOR HEALTH IN DEVELOPING COUNTRIES* (2005), available at <http://www.who.int/genomics/FullReport.pdf>.

the IP owners could hold out and compromise the entire operation, raise a number of problems for business and for the public at large. Because access to such a plethora of IP rights is required, those wanting to enter a line of business using DNA-on-a-chip technology fear that they cannot, and those seeking access to the products that such businesses would have produced are left wanting.⁴ The impact may be life threatening—preventing promising diagnoses and treatments targeted to patients having a number of specific genetic profiles.⁵

To be sure, the theoretical literature has debated whether there is in fact an anticommons problem for property rights in general and for IP in particular.⁶ In his influential work on anticommons, Michael Heller has focused on the fragmentation of interests in an asset.⁷ In response, Richard Epstein and Bruce Kuhlik⁸ and one of the present authors⁹ have pointed out that when the permission of bureaucrats is required, as was the case for the unused stores in the post-socialist economy that were the topic of Heller's initial work, efforts by such bureaucrats to openly trade their permission for personal gain are likely to trigger various forms of legal liability for graft, bribery, public corruption, and the like; and the "market" for buying required approvals from bureaucrats is likely to be relatively thin. IP rights are different, they continue, because an IP owner in the United States does not have the same incentive to avoid open transactions because such deals are lawful and important to monetizing the value of the IP. Other work by one of the present authors extends the analysis to show how the anticommons problem is inapposite to IP rights that are

⁴ The holdout problem discussed here is akin to the problem raised by requiring unanimity in any decision by a group of stakeholders. For example, the problems of requiring unanimity among lenders in efforts to restructure debt are well explored in a separate literature. See generally Robert B. Ahdiieh, *Between Mandate and Market: Contract Transition in the Shadow of the International Order*, 53 EMORY L.J. 691 (2004); William W. Bratton & G. Mitu Gulati, *Sovereign Debt Reform and the Best Interest of Creditors*, 57 VAND. L. REV. 1 (2004).

⁵ See, e.g., Robert F. Service, *Microchip Arrays Put DNA on the Spot*, 282 SCIENCE 396, 397 (1998).

⁶ See *infra* notes 8–11 and accompanying text.

⁷ See generally Heller & Eisenberg, *supra* note 1; Heller, *supra* note 1.

⁸ See Richard Epstein & Bruce N. Kuhlik, *Navigating the Anticommons for Pharmaceutical Patents: Steady the Course on Hatch-Waxman* 4–5 (Univ. of Chi. Law Sch. John M. Olin Program in Law & Econ., Working Paper No. 209 (2d Series), 2004), available at http://www.law.uchicago.edu/Lawecon/WkngPprs_201-25/209.rae-bk.anticommons.pdf.

⁹ See F. Scott Kieff, *Coordination, Property & Intellectual Property: An Unconventional Approach to Anticompetitive Effects & Downstream Access* 42–46 (Wash. Univ. Sch. of Law Pub. Law & Legal Theory Research Paper Series, Working Paper No. 06–06–01, Stanford Law Sch. John M. Olin Program in Law & Econ., Working Paper No. 323, 2006), available at <http://ssrn.com/abstract=910656>.

clear, certain, owned by a residual claimant, and openly tradable; and that the anticommons problem studied by Heller thereby can be seen as no different from the problem of permit thickets studied earlier by Epstein.¹⁰ Put simply, it is the nature of an IP owner's right to exclude or say "no" (or, more precisely, the nature of the associated right to say "yes" to a deal) that is the key to the supposed problem of too many diffuse rights of exclusion—whether termed a "permit thicket" or an "anticommons"—rather than the number of individuals from whom permission must be sought. Nevertheless, because IP rights in the real world never will be perfectly clear, certain, and openly tradable, and because there will never be an absolutely definitive set of all residual claimants, the anticommons problem is one worth further exploration.¹¹

Suggested responses to the anticommons problem include a host of law and policy reforms that target certain types of patents.¹² Representative examples include a shift towards relaxed enforcement of IP rights that in effect would leave enforcement of certain patents only backed up by a liability rule rather than a property rule.¹³ Other examples include the outright elimination or prevention of such patents through the use of various enhanced patentability and patent-validity requirements, such as utility, statutory subject matter, description, and obviousness.¹⁴

This Article offers an alternative response to the anticommons problem, to the extent that it exists, based on private ordering by market actors within the context of existing laws and judicial doctrines.¹⁵ The core of this approach is an appropriately structured op-

¹⁰ See *id.* (citing Richard A. Epstein, *The Permit Power Meets the Constitution*, 81 IOWA L. REV. 407 (1995)).

¹¹ Of course, for even the best-defined property rights, transaction costs are real costs. But for a discussion of the many ways in which, as a practical matter, many of the transaction costs underlying the anticommons problem either are mitigated, rationally borne by property owners who can extract value by decreasing their impact on users, or empirically shown to be almost nonexistent due to broad classes of infringements that are simply allowed to persist, see *id.* at 31–36.

¹² See *infra* notes 13–14 and accompanying text.

¹³ See, e.g., Oren Bar-Gill & Gideon Parchomovsky, *A Marketplace for Ideas*, 84 TEX. L. REV. 395, 412–17 (2005) (discussing liability rule treatment for IP rights); Katherine J. Strandburg, *What Does the Public Get? Experimental Use and the Patent Bargain*, 2004 WIS. L. REV. 81, 142–46 (arguing that certain activities should be given what in effect would be free compulsory license).

¹⁴ See generally Helen M. Berman & Rochelle C. Dreyfuss, *Reflections on the Science and Law of Structural Biology, Genomics, and Drug Development*, 53 UCLA L. REV. 871 (2006).

¹⁵ That is, we take as a given the existing laws and the government that enforces them. Our use of the term "private ordering" does not contemplate the total absence of govern-

erating entity—in the case of a DNA-on-a-chip business, this will be the entity that makes the chips. This entity will serve as a coordination vehicle among the team of relevant stakeholders, which includes IP owners; the promoter of the business, which is likely to be an IP owner itself; and ultimately customers and other interest groups. The basic bargain offered to the myriad IP owners, who are the source of the anticommons problem, is that each owner will receive some financial return, some control over the operating business, and essential collateral information and related business opportunities. In exchange for receiving these benefits, the IP owners will give the operating entity a limited, nonexclusive license to the owner's IP. This feature of the structure speaks directly to the problem of excessively diffuse property rights.

Getting the IP owners to accept the deal offered by the promoter requires that the entity be structured so that IP owners are given a meaningful stake in the business, which will encourage them to opt in. At the same time, the deal must be structured to ensure that each IP owner will have little reason to play holdup games by opting out. Further, the structure contemplates that the business's customers and relevant influential interest groups may "shame" IP owners to participate in the enterprise by waging public relations campaigns on the Internet or through more traditional media outlets.

The core concepts supporting the proposed structure are the dual pillars of coordination and self-restraint. In effect, the transaction is designed to incentivize IP owners to cooperate in the enterprise by credibly committing the parties to a structure that limits the potential upside for an IP owner if it chooses to hold out for a larger stake. The deal structure also leverages social and peer pressure to further encourage opting in. If it is costly to hold out and if doing so promises little upside, it is rational for IP owners to exercise self-restraint and not to act opportunistically, but instead to coordinate their activities through the operating entity. Each IP owner gains from cooperating, not defecting. The coordination and self-restraint contemplated here allow for a private ordering solution to the anticommons problem that avoids some of the costs and risks of legal reform, while suggesting a number of basic policy implications for IP.

ment enforcement of law. Rather, we use "private ordering" to refer to circumstances where parties, given extant legal and regulatory regimes, order the substance of their affairs and transactions as they see fit and resort to the judicial system for enforcement.

Such coordination and self-restraint are two issues often overlooked in the property literature in general, but emphasized throughout the work of both of the present authors.¹⁶ That is, the approach offered here follows the commercialization/coordination theory of IP¹⁷ that often is seen as being “pro-IP” and “pro-IP owners.” Here, the approach is used to show how those wanting access to IP can take seriously the transaction costs facing both IP users and IP owners in developing an entity that mitigates these costs in a way that benefits both groups.

This Article’s proposal follows the “Gilsonian” tradition of showing how lawyers can be helpful “transaction cost engineers” who structure beneficial deals to overcome obstacles.¹⁸ Lawyers are not simply pernicious transaction costs themselves who stand in the way of deals that otherwise would get done.¹⁹ Indeed, many deals would not take place without the efforts of lawyers who find creative ways to bring parties together.

This Article proceeds as follows: Part I sketches the private ordering solution, paying particular attention to some of the basic hurdles it must overcome to have a chance of succeeding. Part II further discusses some complicating obstacles and limitations of the proposal,

¹⁶ See *infra* note 17.

¹⁷ See Kieff, *supra* note 9, at 57–70 (exploring the coordination aspects of commercialization theory). See generally F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINK. L. REV. 697 (2001) (exploring a commercialization theory of IP).

¹⁸ See Ronald J. Gilson, *Value Creation by Business Lawyers: Legal Skills and Asset Pricing*, 94 YALE L.J. 239, 255 (1984) (describing lawyers as “transaction cost engineers”); see also Lisa Bernstein, *The Silicon Valley Lawyer as Transaction Cost Engineer?*, 74 OR. L. REV. 239, 241 (1995) (further exploring Gilson’s analytical framework of the lawyer as transaction cost engineer and, in addition to Gilson, citing Lawrence M. Friedman et al., *Law, Lawyers, and Legal Practice in Silicon Valley: A Preliminary Report*, 64 IND. L.J. 555, 562 (1989) (noting that “[t]he Silicon Valley lawyer not only works with engineers, he thinks of himself as a kind of engineer—a legal engineer . . . his job is to solve problems, to take a principle, a task and engineer it legally”)); Bernard Black & Reinier Kraakman, *A Self-Enforcing Model of Corporate Law*, 109 HARV. L. REV. 1911, 1923 (1996) (pointing out that in addition to lawyers, “savvy investors and issuers” also help facilitate transactions); Curtis J. Millhaupt & Mark D. West, *The Dark Side of Private Ordering: An Institutional and Empirical Analysis of Organized Crime*, 67 U. CHI. L. REV. 41, 58 (2000) (also using term “transaction cost engineers” for lawyers); Troy A. Paredes, *A Systems Approach to Corporate Governance Reform: Why Importing U.S. Corporate Law Isn’t the Answer*, 45 WM. & MARY L. REV. 1055, 1110–12 (2003) (exploring Gilson’s analytical framework of the lawyer as transaction cost engineer).

¹⁹ See Ronald J. Gilson, *Seeking Competitive Bids Versus Pure Passivity in Tender Offer Defense*, 35 STAN. L. REV. 51, 62–63 (1982) (“Let me start with two important elements of transaction costs in the acquisition setting: information costs necessary to identify the opportunity; and mechanical costs—for example, lawyers’, accountants’, and investment bankers’ fees—necessary to effect the transaction and cope with regulatory or other barriers (including defensive tactics by the target).”).

including some challenges that, although we think unlikely to occur, may be especially difficult to overcome if they do. Part III points out how such a private ordering solution avoids some of the risks associated with legal reform. Part IV explores some implications for IP theory and policy that are elucidated by the proposed deal structure.

I. SKETCHING THE BASIC STRUCTURE AND BASIC HURDLES

The Article begins by briefly summarizing the basic structure of the transaction, which is depicted in Figure 1. The discussion then proceeds by unpacking the key features of the deal, including many of the basic and more complex hurdles it must overcome, in the rest of Part I and in Part II.

A. Basic Structure

In the deal, a promoter—the impetus behind the transaction—establishes an operating entity. Most likely, the operating entity will be a limited liability company (“LLC”), although it might also be a limited partnership or a corporation. The operating entity will engage in a business, such as commercializing DNA-on-a-chip technology, that requires access to a plethora of IP rights. It is anticipated that the relevant universe of IP owners will grant the operating entity a limited, nonexclusive license of the relevant IP.²⁰ Assuming the operating entity is an LLC, then each licensor-IP owner will receive a membership interest in the LLC.²¹ Each licensor-IP owner’s equity interest in

²⁰ It is recognized that the key to avoiding the anticommons problem is getting this license granting to occur with a high degree of predictability and certainty. To help the reader understand the basic structure of the deal we are proposing, we provide an overview here and then discuss the more complex reasoning throughout the remainder of Part I and in Part II.

²¹ If the operating entity is a limited partnership, the licensor-IP owners will receive a limited partnership interest; and if the operating entity is a corporation, the licensor-IP owners will receive shares of stock.

The transaction contemplates that the membership interests, limited partnership interests, and shares of stock will be placed in private offerings and thus not subject to the registration requirements of the federal Securities Act of 1933. 15 U.S.C. §§ 77a–77aa (2000). That said, if there are 500 or more licensor-IP owners, the operating entity may have to comply with various requirements under the Securities Exchange Act of 1934 (the “Exchange Act”). 15 U.S.C. §§ 78a–78mm (2000). To avoid Exchange Act requirements, it might be necessary to have more than one operating entity, each of which would have fewer than 500 licensor-IP owners as members, limited partners, or shareholders. Alternatively, it might be possible to structure the transaction to include several pass-through “licensing entities.” Each licensing entity would be a licensee of the licensor-IP owners. The licensing entities in turn would relicense the IP rights to the operating entity and would be

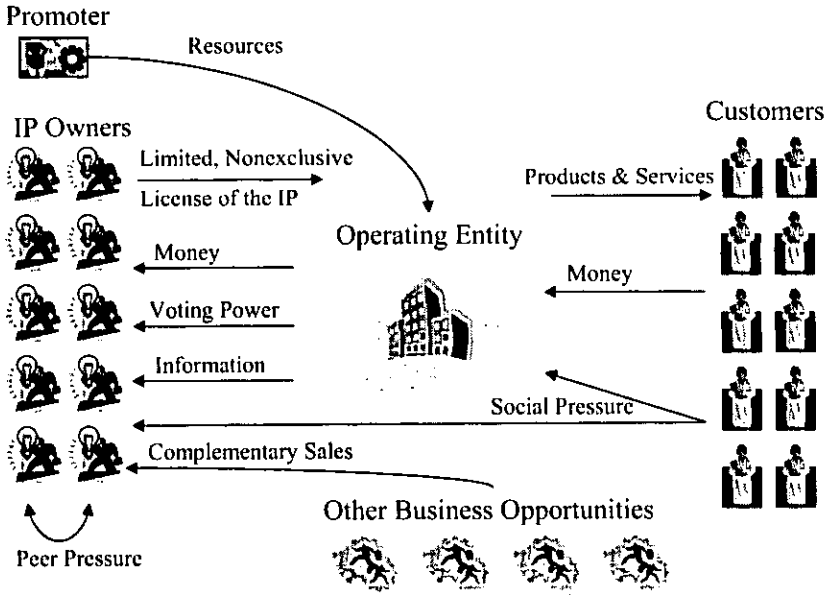
the operating entity will entitle it to some financial return, as well as some control over the entity through voting rights. As a result of participating in the enterprise, we expect that each licensor-IP owner also will receive valuable information and will benefit from complementary sales and other business opportunities that arise from being involved in the enterprise. The promoter will receive similar financial and other benefits, and, as a practical matter, likely will have the most control over most aspects of the entity.

We anticipate that the financial, informational, and other gains from engaging in the enterprise will induce many, if not most or even all, IP owners to opt in to the deal. But the structure allows that peer pressure among IP owners, as well as social pressure from the operating entity's customers and other interest groups, also will encourage IP owners to participate. The structure, though, accommodates the possibility that some IP owners will opt out.²²

the members, limited partners, or shareholders of the operating entity. This two-tiered structure contemplates that there would be fewer than 500 licensing entities to avoid Exchange Act obligations for the operating entity. This all having been said, the membership interests (in the case of an LLC) and the limited partnership interests (in the case of a limited partnership) might not constitute securities under the federal securities laws if the licensor-IP owners exert sufficient control over the operating entity. Neither the Securities Act of 1933 nor the Exchange Act would apply to such nonsecurities. If the operating entity were a corporation, the shares of stock it issues would be securities regardless of how much control the licensor-IP owners exerted. *See generally* LOUIS LOSS & JOEL SELIGMAN, *FUNDAMENTALS OF SECURITIES REGULATION* 82-87, 354-70, 435-44 (4th ed. 2000).

²² An IP owner that does not opt in might not be holding out strategically for more value, but might simply have a reasonable and good faith preference not to participate in the enterprise at all. In some cases, there might be no way to have structured the deal to entice such an IP owner to participate. Some IP owners, for example, might want to "go it alone" or might have other business opportunities on which they prefer to focus, notwithstanding that the operating entity only requires a limited, nonexclusive license of the IP. Some IP owners, however, might have been persuaded to opt in if the deal were structured differently. Accordingly, to maximize the number of IP owners who find the opportunity attractive, the promoter might wish to consult various IP owners early to get a sense of how best to structure the enterprise, including acceptable royalties, governance, and business operations.

Figure 1: Basic Organizational Chart



B. Basic Hurdles: Unpacking the Structure

For the proposed approach to work, it must overcome at least a core set of basic hurdles that businesspeople and their advisors routinely address in structuring deals. First, the entity must be attractive to rational actors focusing on their financial payoffs. That is, the deal must be financially profitable. Second, parties sometimes behave irrationally and typically behave strategically. Recognizing that people respond to more than financial payoffs, the transaction contemplates that reputational sanctions may induce IP owners to opt in when otherwise they might behave opportunistically by holding out for a larger financial stake, even if it jeopardizes the deal. Third, the collective action that the operating entity is designed to facilitate must withstand antitrust scrutiny. Fourth, the entity must generally be seen as socially constructive to mitigate the risk that courts, administrative agencies, or legislatures will not tolerate it.

In the discussions that follow, each obstacle will be addressed in turn and related back to the feature of the deal that responds to it. Each deal component is shown to be loosely analogous to an existing business arrangement. These analogies are offered as helpful examples to illustrate some key aspects of the suggested approach. For this

reason, they are necessarily abbreviated and stylized summaries intended only to highlight particular characteristics of what in the real world are of course highly complex and nuanced arrangements. That is, the accounts of these loosely analogous arrangements are not offered as complete accounts in their own right, but merely as points of comparison to highlight especially salient aspects of the proposed transaction.

Before going further a final caveat about the precise scope of the present project must be noted. The goal of this Article is to suggest a new approach, not to prove or warrant that it will work. As with any new business model, the first step is to explain what it is, how it generally will operate, why it should be considered, and what some major obstacles may be. As with any new business model, the precise contours and details of any version of the structure that is implemented necessarily will be left to the deals that actually get struck in practice. These are beyond the scope of the present project, which is limited to providing an initial sketch of the structure that lawyers, investment bankers, and businesspeople could use as a starting point in doing a real deal. Also, as with any new business model, only actual decisions by agencies, courts, and legislators will show how well the transaction will be received by the legal and political processes. Legal and regulatory risks are always present.

1. Hurdle One: Limited Liability and Financial Payoffs

The first hurdle for the proposed entity to overcome is that it must be structured so that it has at least *prima facie* appeal to rational actors. The key question explored here, therefore, is how to get a huge and diffuse set of rational IP owners focusing on their financial payoffs to elect to give the operating entity sufficient permission to operate so that investment in the entity's operation by the promoter and other members of the team, such as employees and creditors, is worthwhile. The answer, discussed more fully below, is tied to limited liability in two fundamental respects. First, limited liability mitigates the risk that the promoter and the IP owners will be personally liable for any debts or obligations of the operating entity. Second, limited liability helps ensure that the operating entity does not have a "hostage" (for example, substantial retained earnings) that an IP owner choosing to hold out can go after.

The anticommons problem stems from the need to obtain a non-exclusive license from each of the pertinent IP owners to engage at least in the limited use needed to conduct the desired line of busi-

ness. For example, the need to obtain such licenses is implicated in the production of a diagnostic chip containing thousands of patented DNA sequences. The literature stresses the transaction costs and the seeming waste in identifying, finding, and then successfully transacting with such a staggering number of individual IP owners, especially in the face of the risk that any one could hold out and compromise the entire effort after search and negotiation costs associated with many of the others have been incurred.²³ The wasteful costs associated with transacting over these IP rights are particularly troubling where, as is likely the case for a diagnostic DNA chip, no additional know-how or even materials are needed from the IP owner because they are readily available from the public domain. Therefore, the crux of the problem lies in the nature of the IP right itself, which is the right to exclude others from using the subject matter covered by that IP right. Put differently, the problem is seen as being only about freedom to operate, rather than about the need to obtain other goods or services.

Because the IP owner's right to exclude is backed up ultimately by its right to sue an infringer to obtain damages, to obtain damages enhanced by attorney fees and potential trebling, as well as to obtain an outright injunction, the ultimate driver of the anticommons effect appears to be the credible threat of countless lawsuits. But familiar notions of limited liability have long operated, indeed by design, precisely to make business investments more attractive notwithstanding the threat of lawsuits. A business structure that could operate in the face of such a threat offers at least a starting point for a potential solution to the anticommons problem in certain cases.

Thus, the first step in the proposed structure involves setting up the new business within a distinct limited liability entity, such as a separate limited liability company, limited partnership, or corporation.²⁴ Because of the flexibility it affords the parties, an LLC would

²³ See generally Heller & Eisenberg, *supra* note 1; Heller, *supra* note 1.

²⁴ For more on limited liability, see, e.g., Frank H. Easterbrook & Daniel R. Fischel, *Limited Liability and the Corporation*, 52 U. CHI. L. REV. 89, 105–06 (1985); Timothy P. Glynn, *Beyond "Unlimiting" Shareholder Liability: Vicarious Tort Liability for Corporate Officers*, 57 VAND. L. REV. 329, 336–43 (2004); Henry C. Manne, *Our Two Corporation Systems: Law and Economics*, 53 VA. L. REV. 259, 261–65 (1967); Robert B. Thompson, *Unpacking Limited Liability: Direct and Vicarious Liability of Corporate Participants for Torts of the Enterprise*, 47 VAND. L. REV. 1, 6–10 (1994). See generally Joseph A. Grundfest, *The Limited Future of Unlimited Liability: A Capital Markets Perspective*, 102 YALE L.J. 387 (1992); Paul Halpern et al., *An Economic Analysis of Limited Liability in Corporation Law*, 30 U. TORONTO L.J. 117 (1980); Henry Hansmann & Reinier Kraakman, *Toward Unlimited Shareholder Liability for Corporate Torts*,

probably be the preferred entity form. Limited liability for a firm's equity holders and other stakeholders will provide an incentive to invest in the entity despite the threat of countless lawsuits by IP owners. Although it may seem unattractive to invest in an entity that may face countless lawsuits, many firms operate in the face of possibly countless claims. For example, Dow Corning has continued to operate in the face of myriad litigations involving its breast implant business;²⁵ numerous companies, such as Halliburton, continue to operate in the face of seemingly endless asbestos litigation;²⁶ Merck continues to research and develop pharmaceuticals notwithstanding being tied up in countless lawsuits over Vioxx;²⁷ and the tobacco companies have not gone out of business. In each of these instances, despite the spectre of costly litigation, the businesses presently are operating in a way that generates gains for each of the firm's constituencies: shareholders, managers, laborers, business creditors, and customers. Put differently, the combination of the limited liability of the corporate form with the nonfraudulent transfers of dividends, salary, debt service, and customer support makes their business activity worth pursuing, even in the face of so many lawsuits. The basic purpose of these analogies is to instantiate how a business can operate in a way that benefits stake-

100 YALE L.J. 1879 (1991); David W. Leebron, *Limited Liability, Tort Victims, and Creditors*, 91 COLUM. L. REV. 1565 (1991).

For a discussion of the related topic of judgment proofing, see generally Lynn M. LoPucki, *The Death of Liability*, 106 YALE L.J. 1 (1996); Lynn M. LoPucki, *The Essential Structure of Judgment Proofing*, 51 STAN. L. REV. 147 (1998); Lynn M. LoPucki, *The Irrefutable Logic of Judgment Proofing: A Reply to Professor Schwarcz*, 52 STAN. L. REV. 55 (1999); Lynn M. LoPucki, *Virtual Judgment Proofing: A Rejoinder*, 107 YALE L.J. 1413 (1998); Charles W. Mooney, Jr., *Judgment Proofing, Bankruptcy Policy, and the Dark Side of Tort Liability*, 52 STAN. L. REV. 73 (1999); Steven L. Schwarcz, *The Inherent Irrationality of Judgment Proofing*, 52 STAN. L. REV. 1 (1999); Steven L. Schwarcz, *Judgment Proofing: A Rejoinder*, 52 STAN. L. REV. 77 (1999); Steven Shavell, *The Judgment Proof Problem*, 6 INT'L REV. L. & ECON. 45 (1986); James J. White, *Corporate Judgment Proofing: A Response to Lynn LoPucki's The Death of Liability*, 107 YALE L.J. 1363 (1998). For a discussion of these issues by the present authors in a different context, see F. Scott Kieff & Troy A. Paredes, *An Approach to Intellectual Property, Bankruptcy, and Corporate Control*, 82 WASH. U. L.Q. 1313, 1331-38 (2004).

²⁵ See Press Release, Dow Corning Corp., Dow Corning Emerges from Chapter 11 on June 1, 2004 (June 1, 2004), available at http://www.dowcorning.com/content/news/pr_chapter11emergence.asp?DCWS=&DCWSS= (describing Dow Corning's financial recovery from the breast implant litigation).

²⁶ See Halliburton, Asbestos Primer, http://www.halliburton.com/ir/asbestos_primer.jsp (last visited Nov. 9, 2006).

²⁷ See Press Release, Merck & Co., Merck Updates Status of VIOXX Litigation and SEC Inquiry (Jan. 28, 2005), available at http://www.merck.com/newsroom/press_releases/corporate/2005_0128.html.

holders even when facing the risk of a set of impending claims that could put the enterprise out of business.

But perhaps more important for present purposes is the flip side of this limited liability coin—specifically, the proposed structure leverages the veil of limited liability to help ensure that the IP owners eventually are constrained and choose cooperation over defection when facing such a business by making it considerably more likely that the operating entity will not have an interest in a potential hostage that is worth it to an IP owner to threaten. Put differently, a basic challenge of the deal is to dissuade IP owners from holding out for a larger piece of the pie. This is always a concern when parties bargain. We take up this issue more in Part II, but we stress one point here: the operating entity could be financed and run in a way so that it has few assets, which helps ensure that the benefits for an IP holder of opting in exceed the potential gains from holding out.

The structure contemplates that any profits the operating entity enjoys will regularly be distributed to the promoter and licensor-IP owners, leaving few profits in the entity. Consequently, an IP owner that holds out will only find a small pool of assets that it can tap into in a successful infringement action. And the corporate veil of limited liability will go a long way toward ensuring, although without absolutely guaranteeing, that the suing IP owner cannot pierce through the entity to go after the assets of the promoter or the participating IP owners.²⁸ Indeed, businesses regularly “judgment proof” themselves in this fashion, and courts routinely respect such corporate structuring.

More to the point, the entity could be run to make sure that the existing claims on its future gross receipts come as close as possible to approximating their value. For example, those participating in the entity, including the promoter itself, may have claims in the form of ordinary employment compensation or other contract pay, such as consulting fees or factory-line rental fees, aside from their equity stake. Simply recharacterizing profits as some form of contract payment (wage, rent, etc.) as a way of “zeroing out” the operating entity

²⁸ For more on veil piercing, see generally Stephen M. Bainbridge, *Abolishing LLC Veil Piercing*, 2005 U. ILL. L. REV. 77; Stephen M. Bainbridge, *Abolishing Veil Piercing*, 26 J. CORP. L. 479 (2001); Robert B. Thompson, *Piercing the Corporate Veil: An Empirical Study*, 76 CORNELL L. REV. 1036 (1991).

In addition, in the face of adverse judgments against it for infringement, the operating entity's willingness and ability to file bankruptcy may leave little if any value for holdout-IP owners that successfully sue.

may still leave an available hostage for a holdout. But concessions would be required from the recipients of these wage, rental, and similar payments to release these funds for payment to a holdout. In addition, once made, such payments to the promoter or certain licensor-IP owners should be further out of reach of a creditor (such as a holdout having a judgment for infringement in its favor) than distributions of the operating entity's profits. Moreover, claimants to the operating entity's profits may be third parties. In that case, any required concessions would be particularly difficult to obtain to release funds to pay a holdout to opt in; and any sort of piercing the corporate veil doctrine or broad theory of substantive consolidation should not bring payments to such third parties within the reach of an IP holdout. Further, the operating entity may be emboldened in refusing any holdout's demands because renegeing on the operating entity's wage and contract terms with third parties could have serious reputational consequences for the enterprise.²⁹

Because the operating entity is likely to be new rather than established, initial financing presumably will be needed, such as for various capital assets including real estate and equipment. Appropriately structured financing with debt, as opposed to equity, can further decrease the potential hostage threat to the owners of the operating entity while at the same time decreasing the direct benefit available to an IP owner wanting to sue for infringement. Not only does the use of debt ensure there is a preexisting claim against the entity's cash flow, but the use of a security interest in the operating entity's underlying assets—be they plant, equipment, real estate, inventory, or receivables—would both protect the creditor and decrease the resources available to satisfy a judgment in favor of a holdout. Additionally, the operating entity can ensure that it does not own any substantial assets by simply renting what it needs for the business. For example, to the extent established factories owned by others often are not in continuous use, such excess capacity may be rented. Indeed, such foundry services are a big business in the modern electronics industry.³⁰ The business renting these re-

²⁹ To be sure, the operating entity's interest in using revenues to make such payments can trigger its own hostage effect in at least two ways. First, the revenues themselves may be attractive to a holdout as a source of direct financial benefit that can be taken. Second, the revenues can be blocked from reaching the parties to which the operating entity owes money in a way that will cause a negative reputational effect for the operating entity if the holdout successfully obtains an injunction.

³⁰ See Norm Alster, *Investing: Considering Chip Shares? Look for Plant Owners*, N.Y. TIMES, Feb. 1, 2004, § 3, at 36.

sources to the operating entity may or may not be related to the operating entity—that is, the lessor may be the promoter, an IP owner, or some third party.³¹

To deprive a holdout of a possible hostage to target, the operating entity also can keep its overall revenue stream low by, for example, offering the DNA chip at a low price. Although such a pricing strategy decreases the hostage effect, it does not compromise what likely are key benefits for participating IP owners and the promoter—namely, the informational benefits and derivative business opportunities discussed below. To the contrary, setting a low price should encourage wider use of the DNA chip and might be a good public relations strategy for the enterprise and its constituencies. This could feed back into more social and peer pressure being brought to bear on holdouts, encouraging them to opt in. Any hostage risk posed by the informational and derivative business benefits would be mitigated by the fact that the holdout would be denying itself access to such benefits if it were to shut down the operating entity.

Although a strategy of keeping financial profits low seems counterintuitive, such a strategy may be key to reducing the holdout risk by denying a potential holdout a hostage that it can take for bargaining leverage. Even if some participants in the operating entity preferred a more traditional profit maximization strategy, the marginal benefit of generating a larger profit and more free cash flow may not be sufficiently attractive when compared to the added risk this creates by offering a more attractive hostage to a holdout. Thus, the choice of

³¹ We are designating as the “promoter” the person—human being or legal person like a business—who basically organizes the operating entity in the first instance. This person may be an IP owner or someone interested in complementary business activities. It is imaginable that instead of being a for-profit, private sector business the promoter is a government agency, a nongovernmental organization, or a university. Our intuition, though, is that others are more likely to participate in the enterprise if the promoter is a for-profit, private sector person than if it is a government entity or a non-profit organization, because the promoter’s for-profit, private sector status is likely to give it a more open and predictable agenda as a business partner. We also think that, for society as a whole, it will be better for the promoter to be a for-profit, private sector person because we think that the market’s price system is generally better at deciding which deals should be done, although we of course recognize that this is open to debate. Put differently, we would prefer that the actual stakeholders—promoter, IP owners, employees, creditors, and customers—make the decisions, not political players or bureaucrats.

It should also be noted that in structuring the deal, the promoter’s interests have to be taken into account. Initiating and operating the DNA-on-a-chip business will require non-trivial amounts of money, skill, time, etc. In exchange, the promoter will want cash, kudos, control, etc. How much of each of these the promoter gets will be a function of how the transaction transpires in practice.

low profits and few IP owner holdouts is preferable to high profits and a substantial risk of holdouts and infringement lawsuits.³²

The combined effect of these steps should lead to a business entity that has a narrow and shallow pool of assets and, if desired, a net income stream that is not much more than a trickle. To keep potential litigants at bay, the entity is designed to be simultaneously unappealing as a litigation target and appealing as a business partner.

In fact, the operating entity has its own ability to threaten hostages in a way that can exert leverage over IP owners. The key to a patent owner's value is the credible threat of an infringement suit, and obtaining a final court judgment of infringement can be significantly stalled, if not prevented, for almost any patent today if the patent is placed into reexamination before the Patent Office. Thus, the operating entity can threaten to place into reexamination any patent owned by a holdout.³³ Putting a holdout's patent into reexamination would cost the operating entity very little and, in effect, would likely tie up the patent in the Patent Office for several years, interfering with any enforcement or licensing efforts by the IP owner.

It is not enough just to create a disincentive to sue for infringement. For the operating entity to be appealing as a business partner to the IP owners, the IP owners must enjoy a real upside from opting in. The entity must announce a set of "rules" (deal terms) that offer every potential claimant who might otherwise sue for infringement the option to bring its own bona fide straw—albeit only a narrow

³² The opt in / hold out decision facing each IP owner is itself a game among the IP owners, not just a game between the IP owners on the one hand and the promoter on the other. While each holdout may stand to gain a considerable amount if it were the only holdout, the potential value of holding out decreases as the number of holdouts increases. This description recalls a classic prisoner's dilemma. Cf. Doug Lichtman, *Patent Holdouts in the Standard-Setting Process* 2–3, 10–12 (Univ. of Chi. John M. Olin Program in Law & Econ., Working Paper No. 292, 2006), available at <http://ssrn.com/abstract=902646> (arguing that with many potential holdouts in a standard-setting process, the incentive of each IP owner to sue is diminished).

³³ For a discussion of the modern reexamination system, including the reasons it can be viewed as placing a large cloud over all patents in a socially undesirable manner, see F. Scout Kieff, *The Case for Registering Patents and the Law and Economics of Present Patent-Obtaining Rules*, 45 B.C. L. REV. 55, 115–18 (2003) (discussing the public choice problems with modern reexamination proceedings). The theoretical concerns about reexamination have been borne out in the recent proceedings over the patent asserted against the Blackberry service. See *Patents/Reexamination: NTP Charges Misconduct in PTO's Review of Patents in Blackberry Dispute*, 72 PAT. TRADEMARK & COPYRIGHT J. 52, 52–53 (2006) (discussing the many ways in which the infringer in that case brought improper political pressure and gained improper access to secret Patent Office proceedings as tools for holding the patentee's patent hostage during litigation and settlement proceedings).

one—to come drink from the entity’s asset pool. That is, every IP owner with a potential bona fide claim for infringement must be offered a chance to receive a modest royalty payment in exchange for granting a license to the operating entity. This might be through a separate licensing arrangement or, more likely, through the structure of the entity itself. For example, if the proposed entity is an LLC, each IP owner could be granted a membership interest in the entity, with a right to participate in the entity’s profits, in exchange for granting the entity a license. Using a separate licensing arrangement suffers from one particular disadvantage—namely, it leaves open the possibility that the promoter will have to engage in one-off negotiations with each IP owner. This matters because it creates numerous bilateral bargaining situations in which an IP owner can threaten holding out if it does not receive a larger piece of the pie (or, to mix metaphors, a bigger straw). Alternatively, the promoter could offer the LLC agreement for the operating entity to all IP owners on a take-it-or-leave-it basis with each IP owner’s stake in the business represented by its membership interest in the LLC. This second approach credibly commits the promoter to a predetermined deal with the IP owners that is not open to renegotiation. Essentially, the promoter takes off the table the prospect of giving IP owners different deals if they all must sign up to the entity’s LLC agreement, an agreement that the promoter cannot realistically go back and restructure.³⁴

The precise terms governing IP owner royalties may take several forms. For example, because early certainty will be important to all constituencies, a higher amount may be offered to those who self-identify early, providing an incentive to do so.

In addition to the direct financial return the IP owners enjoy in exchange for granting limited, nonexclusive licenses to the operating entity, the IP owners also will have the opportunity to exercise at least some control by participating in the entity’s governance. This will give the IP owners a different type of ownership in the operating entity than money: the right to participate in its decision making. Exactly how much influence the IP owners will have as compared to the promoter is an important deal term that will have to be negotiated within the context of each transaction. Such management questions are not unique or intractable, though. Governance has to be dealt with in nearly all deals.

³⁴ For more, see *infra* notes 69–73 and accompanying text.

Aside from the profit interest licensor-IP owners will enjoy, participation in the operating entity also should generate substantial indirect benefits for the IP owners, providing further incentive for IP owners to opt in, even if, as suggested above, the entity's financial profits are kept low. It is quite possible that these indirect benefits will be much larger economically than the IP owner's direct financial benefits from the operating entity's business. For example, in the case of a DNA-on-a-chip business, each participating IP owner presumably will learn a great deal of information that will meaningfully help it derive financial benefit from other uses of its IP. The main purpose of technologies like DNA-on-a-chip is that such technologies allow a large, seemingly homogeneous population to be segmented into distinct subpopulations. By giving the chip venture a limited, nonexclusive license to include its particular DNA segment on the chip, the owner of a patent on that DNA segment will at a minimum learn which subpopulations are interested in its DNA segment and may gain insight into new uses for the DNA segment.³⁵ The licensor-IP owner or its other business partners will then be able to derive financial returns from a business model that uses the DNA segment to further treat or diagnose that subpopulation or for other uses that come to light as a result of having participated in the operating entity.³⁶ In short, licensor-IP owners likely will benefit from additional business opportunities that are derivative of their decision to opt in to the structure we propose.

To summarize, the upside for IP owners and the promoter is that the deal gets done, which generates some financial gains from the operating entity's business for the IP owners and the promoter, but which also generates useful information for IP owners that may be exploited in other business ventures. The deal may also generate useful information and business opportunities for the promoter, which itself may contribute IP to the enterprise. The incentive to opt in is coupled with a disincentive for IP owners to hold out. One key to dissuading IP owners from holding out is to structure the deal so that there is no meaningful available hostage for a holdout to take. At a

³⁵ The license given by the IP owners to the operating entity only needs to be nonexclusive and limited to the entity's particular business model, because that is all the entity needs to operate. At the same time, this preserves the ability for the IP owners to extract value from other business ventures, including other iterations of the type of entity proposed here.

³⁶ These are similar to the benefits that the Google Library Project offers to IP owners. See *infra* notes 55–63 and accompanying text (discussing the Google Library Project).

minimum, the assets and free cash flow the operating entity has available to satisfy any judgment against it in favor of an IP owner suing for infringement must be sufficiently small so that the transaction costs an IP owner incurs in attempting to appropriate such value makes litigation uneconomical.

The limited pool of operating entity net assets, particularly if combined with a limited trickle of net income, impacts an IP owner's payoffs. The IP owners that arrive with a straw in hand to drink from the pool of the operating entity's assets and income stream will face a relatively straightforward payoff choice. They can either use the straw to take a sip or they can sue and net little to nothing. That said, the operating entity need not be a financial failure to achieve this result, and in fact may do quite well. It is simply that the resources an IP owner can expect to appropriate by holding out need only be exceeded by the financial and other costs of litigation for IP owners to rationally elect to opt out of litigation and in to the entity. A suit for enhanced damages will not increase the resources the entity has available for the IP owner. It simply will mean that the IP owner has a larger unsatisfied judgment. In addition, a suit for an injunction will only cut off whatever operating entity income the IP owner was otherwise hoping to participate in by successfully suing for infringement.

Our intuition is that the above structure provides sufficient reasons to anticipate that many IP owners will opt in. We believe that many of those not opting in having gotten this far in the analysis ultimately will opt in for reasons explored below in Part I.B.2.³⁷ We also recognize that a 100% opt-in rate is not likely to be possible in every case, nor is it likely to be needed in any.

Accomplishing the proposed deal will itself entail transaction costs. Transaction costs associated with bargaining over IP rights are always to some extent shared between the IP owner on the one hand and the potential infringer/assignee/licensee on the other. In the proposed structure, many transaction costs will be borne by the IP owners. More particularly, many of the ongoing costs of identifying and finding the deal partner are borne by the IP owners because the operating entity can use those DNA segments for which it obtains permission and avoid those for which it does not. In other words, once the promoter advertises the transaction to the community of IP owners, IP owners will have an incentive to self-identify in order to enjoy

³⁷ One can never say that there is absolutely zero risk of a lawsuit for infringement, but we believe the proposed structure reduces the risk considerably.

the benefits of participating in the enterprise. This is particularly true when it becomes evident that remaining unknown and waiting to sue for infringement later promises a holdout no net upside. The costs incurred by the promoter will primarily stem from setting up the structure in a way that, as described throughout this Article, provides incentives for IP owners to come to and opt in to the enterprise. Also, there surely will be ongoing transaction costs borne by all parties as the operating entity conducts its business.

The entity—or, more likely, the promoter—also can adopt a variety of strategies to mitigate transaction costs. Representative examples include some of the relatively new strategies generally available through the Internet. For example, the entire deal could be advertised, and even largely consummated, by the use of a thorough and interactive set of Web pages. The pages would exchange information and facilitate bargaining between the promoter and the IP owners long before the operating entity begins to operate. Just like the Apple iTunes business is conducted on the Web to issue vast numbers of IP licenses in exchange for receiving small payments from each customer,³⁸ the operating entity could operate a Web page that is essentially the reverse model, in which vast numbers of IP licenses are received from a large population of IP owners in exchange for giving royalties or a membership interest in the LLC.

At bottom, the entity will operate by facilitating coordination among the many IP owners by binding them to a set of rules resulting in a high degree of self-restraint from opportunistic behavior. At least this is the case if all decisions are informed and rational. To help ensure that they are informed, the promoter must take great strides to advertise the strategy. Little can be done, however, to eliminate the inevitable human frailties that render individuals only boundedly rational. For example, there is always the possibility that an IP owner will dig in and irrationally commit itself to a negotiation strategy in which the owner refuses to recognize the financial folly of holding out. Plus, individuals often get emotional in negotiations. We even allow that some rational IP owners may simply believe that opting out eventually will result in a bigger payoff, notwithstanding the attempt to structure the deal so that is not the case.

³⁸ See Apple iTunes Homepage, <http://www.apple.com/itunes/overview> (last visited Nov. 8, 2006).

2. Hurdle Two: Behavioralism and Peer and Social Pressure

It is recognized that structuring the financial payoffs that IP owners face so that it is rational for them to opt in does not mean that they all will. People are not perfectly rational, and a holdout IP owner may not be convinced that the promoter and the other IP owners are unwilling or unable to deliver additional value to avoid the holdout. Moreover, an individual who perceives an act of infringement—threatened or actual—against his or her IP is likely to be even less rational and more emotional than otherwise. The combined use of peer and social pressure may help cabin any resulting holdout behavior that arises by appealing to different sensibilities of the holdout IP owner than direct financial payoffs do.

For the entity proposed here, any one IP owner's decision to hold out would frustrate not only all of the other thousands of IP owners who have opted in. Holdouts also would compromise the well-being of the vast patient population who would be potential customers of the business and who would hope to obtain their important medical screening information. Consequently, the operating entity need not be left to fend for itself on the battlefield as the target of a dispute waged by an IP owner who opts out. Because of the stakes facing the other members of the production team, some of whom are peers of the holdout IP owner and others of whom are sympathetic patients, the operating entity itself can take steps to help ensure that these different constituencies are sufficiently informed of the problems wrought by holdouts so that they themselves will take on the battle against the holdout IP owner. One could imagine licensor-IP owners pressing holdouts to participate in the business. One also could imagine patient groups and organizations such as the American Cancer Society waging some form of public relations campaign through the Internet or traditional media exhorting holdout IP owners to opt in. The promoter could also take steps to inflict reputational harm on holdouts. In short, holdouts may be shamed into joining the enterprise.⁹⁹

To the extent that a holdout is at all "other regarding," simply appealing to the holdout's sense of "right" and "wrong" may sway an IP owner to opt in to be part of a positive effort to improve the health

⁹⁹ For discussions of shaming in a related context, see Paredes, *supra* note 18, at 1086–92. See generally David A. Skeel, Jr., *Corporate Shaming Revisited: An Essay for Bill Klein*, 2 BERKELEY BUS. L.J. 105 (2005); David A. Skeel, Jr., *Shaming in Corporate Law*, 149 U. PA. L. REV. 1811 (2001).

and welfare of people, especially where the stakes may be life and death, instead of being an obstacle to such progress.⁴⁰

The operating entity, and by extension the promoter, may also be subject to social pressure similar to that on a holdout IP owner. If so, the operating entity, as well as the promoter, could claim to be caught in the middle when dealing with holdouts in a way that may shift the tenor of the negotiations. For example, in negotiating with a holdout, the operating entity's management can draw on the public's expressed desire for the DNA chip in urging the holdout to agree to opt in.

The type of peer and social pressure contemplated here is somewhat analogous to the peer and social pressure that has been at play in the serial bankruptcies—or near bankruptcies—facing modern airlines.⁴¹ Rather than being disputes that are entirely characterized as management (or capital) against labor, the financial turmoil facing airlines has often involved efforts by one labor group to hold out in a way that threatens the interests of shareholders, creditors, management, other labor groups, and customers.⁴² In an employee-owned company like United Airlines,⁴³ when a union holds out in labor negotiations, it threatens the interests of all employees in their role as shareholders, as well as in their role as employees hoping for continued employment. Ticketed customers are an additional important population of potentially adversely impacted individuals who can provide broader social pressure against a holdout labor group. When faced with a holdout, a company's only realistic options often are to

⁴⁰ For more on other-regarding behavior, sometimes referred to simply as altruism, see generally Lynn A. Stout, *Other-Regarding Preferences and Social Norms* (Georgetown Univ. Law Ctr. 2001 Working Paper Series in Bus., Econ. & Regulatory Policy, Working Paper No. 265902, 2001), available at <http://ssrn.com/abstract=265902>.

⁴¹ See, e.g., Susan Carey, *United Lobbies for More Savings from Its Unions—Airline Says Concessions Must Reach \$2.4 Billion to Preserve Operations*, WALL ST. J., Dec. 16, 2002, at A2 (discussing cyclical nature of these bankruptcy proceedings in which first one labor group and then another threatens to hold out); Amy Merrick, *Northwest Pilots Vote to Reopen Contract Talks*, WALL ST. J., Sept. 2, 2005, at A10 (same).

⁴² For example, after its mechanics' union went on strike in August 2005, Northwest Airlines suffered a drop in efficiency from pilots and flight attendants still working but unwilling to cooperate with replacement workers. See Jeremy W. Peters & Micheline Maynard, *The Replacement Mechanics: \$27 an Hour and Some Choice Words from Northwest Strikers*, N.Y. TIMES, Aug. 24, 2005, at C1.

⁴³ During United's 1994 financial crisis, the airline reimbursed employees for their compensation concessions with fifty-five percent of the stock in parent company UAL and control of the company. See Greg Burns et al., *United's Undoing: A War Within*, CHI. TRIB., July 13, 2003, at 1. A later deal in 2002 took control from employees when other concessions were not sufficient to rescue the company. See Susan Carey, *Leading the News: UAL Workers Lose Majority Rights as Stake Declines*, WALL ST. J., Mar. 10, 2003, at A3.

permanently replace striking workers to the extent the law and labor markets allow, or to bow to the holdout union to the disadvantage of other stakeholders, particularly if caving jeopardizes the firm's long-term financial viability.⁴⁴ Neither seems particularly attractive to the airline's other stakeholders. This, then, creates the potential for a formidable combination of both peer and social pressure on each individual labor group not to hold out and strike lest it trigger outrage and frustration on the part of other employees and customers.⁴⁵

To be sure, the combination of the efforts to deter rational, as well as irrational and emotional, holdouts may still be insufficient to deter all holdouts. In such cases, the proposed DNA-on-a-chip business approach can simply omit the sequences covered by the IP rights owned by those who do not opt in.⁴⁶ To the extent that the total number of

⁴⁴ Northwest Airlines permanently replaced nearly two thousand striking mechanics in August 2005 as its other unions did not support the labor action. See Micheline Maynard & Jeremy W. Peters, *Northwest Keeps Flying as Its Mechanics Strike*, N.Y. TIMES, Aug. 21, 2005, § 1, at 18.

⁴⁵ See, e.g., Micheline Maynard & Jeremy W. Peters, *Northwest Airlines Threatens to Replace Strikers Permanently*, N.Y. TIMES, Aug. 26, 2005, at C3 (explaining that certain Northwest unions were critical of the non-AFL-CIO mechanics' union's refusal to permit a vote on the proposed contract to take place and that these unions expressed that they were agreeable to allowing permanent replacement workers for the mechanics); Jeremy W. Peters & Micheline Maynard, *Head of Mechanics' Union Reassures Airline Strikers*, N.Y. TIMES, Aug. 30, 2005, at C3 (reporting that during the Northwest mechanics' strike, other Northwest unions did not support the mechanics, including the withdrawal of an invitation to the mechanics); Melanie Trotman, *Pilots' Talks with American May Lift Catch-Up Bid*, WALL ST. J., Nov. 4, 2005, at A6 (discussing attempt by the American Airlines pilots' union to jump the gun on the next round of cuts proposed at their airline in order to gain position on other unions in negotiations with the company and noting that it was expected that this endeavor would also pressure other unions into talks with management and the union was planning on involving them in broader deals); Edward Wong & Steven Greenhouse, *Tension Mounts Between United and Machinists*, N.Y. TIMES, Dec. 4, 2002, at C1 (reporting that to keep the airline out of bankruptcy court, pilots and attendants at United levied social pressure on the mechanics' union to accept a second proposed agreement to \$700 million in wage and benefit concessions after the mechanics' union had rejected the first agreement by a 57-43 margin); Edward Wong, *United Air's Family Is Anything But*, N.Y. TIMES, Oct. 6, 2002, at 31 (illustrating a criticism by United's pilots' union of United's machinists' union for not making concessions that could have kept the airline financially afloat, and instead risking bankruptcy and losing employee control of the company).

⁴⁶ A middle-ground strategy, discussed in more detail below in Part II.A, would be to keep those pieces of DNA in the project and proceed to commit acts that may ultimately constitute infringement with the expectation that the ordinary interactions that inevitably accompany the initiation and prosecution of an infringement suit will lead to the settlement of any such suits that are brought. To satisfy potential judgments that may come from these suits, a good faith estimate of all possible future demands for payment might be paid out on the front end into a separate trust for the benefit of future claimants. This technique is presently used for plaintiff class action suits in modern tort cases in which all plaintiffs have not yet even been identified.

sequences covered by the set of IP rights that the operating entity can use remains large, the business will be producing a chip of significant use. So long as the DNA chip has considerable use, there is still reason for the operating entity to move forward, notwithstanding that DNA sequences are "missing" because of some holdouts. That said, to the extent that the marginal use from including a holdout's IP is sufficiently valuable, the participating IP owners, as well as patients and their advocates, will have an interest in pressuring any holdouts to opt in. Simply put, although the DNA chip is not "all or nothing," the more DNA sequences the chip has, the better. In most cases, it is likely that the operating entity will be able to derive a sufficient benefit from having a large number of participants so that excluding some will not be fatal.

3. Hurdle Three: Antitrust and Collective Action Benefits

Because the entity in effect coordinates a huge set of IP owners in a given field—in the case of a DNA chip, the number is likely to be in the thousands, covering a vast number of the sequences relating to a particular medical condition—the entity must at least consider antitrust concerns. Although this level of integration may indeed trigger a serious antitrust red flag, the social benefits conferred by such an arrangement are likely to mitigate these antitrust concerns.

It is important to recognize the limits of such antitrust concerns themselves. In the past, horizontal arrangements among practically the entire set of thousands of entities within a given field probably would have triggered a *per se* antitrust violation.⁴⁷ But this is not likely to occur today for several reasons. First, the arrangement proposed here can be seen as vertical rather than horizontal because it is between the user of the IP (that is, the operating entity and the promoter) and the IP owners, rather than directly among the IP owners. Modern analysis of vertical integration is significantly more permissive.⁴⁸ Second, in most cases *per se* treatment has been replaced by the "rule of reason."⁴⁹ The outcry within the literature over the anti-

⁴⁷ Such an antitrust violation is governed by the Sherman Antitrust Act, 15 U.S.C. §§ 1–7 (2000 & Supp. IV 2004). See PHILLIP AREEDA & LOUIS KAPLOW, *ANTITRUST ANALYSIS: PROBLEMS, TEXT, CASES* 166–202 (5th ed. 1997) (discussing *per se* illegality of price fixing); Joseph W. deFuria, Jr., *Reasoning Per Se and Horizontal Price Fixing: An Emerging Trend in Antitrust Litigation?*, 14 *PEPP. L. REV.* 39, 43 (1986) (stating that historically "horizontal price fixing practices were sentenced to *per se* condemnation in a fairly traditional and predictable manner").

⁴⁸ See generally AREEDA & KAPLOW, *supra* note 47, at 609–784.

⁴⁹ For more on the rule of reason, see *id.* at 165–251.

commons problem discussed earlier⁵⁰—namely, that transaction costs block beneficial deals from taking place—itself essentially justifies the existence of substantial consumer benefits arising from the proposed transaction. The provision of a good or service by the operating entity that otherwise is not available to consumers is likely to satisfy a rule of reason analysis. Indeed, joint venture arrangements often satisfy a rule of reason antitrust analysis as being procompetitive precisely because consumers benefit from new offerings.⁵¹

The argument here recalls the type of analysis that has allowed artist rights collectives, such as ASCAP and BMI, to operate without violating the antitrust laws.⁵² Yet the case for finding no antitrust violation for the operating entity is even stronger than it is for ASCAP and BMI because the transaction provides additional benefits of the type often included in the sort of all-things-considered rule of reason analysis. For many of the items being bundled in the proposed entity there is no established market at all. In contrast, one factor that made the antitrust case against ASCAP and BMI as strong as it was is that established markets for artist rights did exist and so the bundling of the rights could lead to real monopoly effects.⁵³ Further, the proposed entity allows IP owners to coordinate with each other before making significant investments in their own activities. Allowing a collective enterprise like the proposed operating entity at this time, before the DNA-on-a-chip marketplace has matured, does not raise any serious spectre that IP owners will have their investment-backed expectations frustrated if the transaction passes antitrust muster. In addition, such coordination has the added benefit of promoting certain efficiencies. Also, unlike the relatively limited number of entities that operate like ASCAP and BMI, the proposed entity is in no way exclusive. It is anticipated that there could be large numbers of entities structured similarly to the operating entity and serving even fully or partially overlapping customer bases.⁵⁴

⁵⁰ See *supra* note 2 and accompanying text (discussing anticommons problems in IP).

⁵¹ See generally AREEDA & KAPLOW, *supra* note 47, at 203–51.

⁵² See *Broad. Music, Inc. v. Columbia Broad. Sys., Inc.*, 441 U.S. 1, 7 (1979); cf. Lichtman, *supra* note 32 (offering an account of collective rights organizations based on game theory).

⁵³ While the advent of broadcast music popularly supplanted previous music formats, there had been an established market for sheet music licensing before ASCAP and BMI. See Lucia S. Schultz, *Performing-Right Societies in the United States*, NOTES, Mar. 1979, at 511, 513; ASCAP Celebrates 60th Anniversary, MUSIC EDUCATORS J., Sept. 1974, at 104, 105.

⁵⁴ Indeed, because the inventors of the structure proposed in this Article (the Article's authors) are academics able to extract some benefit if the ideas in the Article enjoy some

4. Hurdle Four: Deal Acceptance

The purpose of the proposed deal structure is to provide an option that is attractive to both IP owners and users but that does not appear to have been considered previously. We believe that the proposed structure can achieve a transaction that is beneficial to all interested parties but otherwise is not getting done. It is nonetheless recognized that some may see the proposal as one that essentially imposes itself on IP owners—as a kind of “cram down” plan for what amounts to mass infringement. That sort of mass infringement, if it were to occur, might repulse some, although it should be noted that there is always some risk of infringement in any IP-intensive business. But even widespread infringement may be tolerated if the social benefits are sufficiently large. Indeed, the public response to an approach that is somewhat analogous to the proposed DNA-on-a-chip structure—namely, the model at the core of the Google Library Project—suggests a far greater tolerance than might be anticipated for a business that may be seen as imposing agreement on IP owners.⁵⁵ Indeed, to some extent, the Google Library Project is even seen as attractive or fashionable.⁵⁶

Here we draw a loose analogy to the Google model as another example of an effort to solve a collective action problem among many IP owners. The Google Library Project essentially involves placing full-text versions of the contents of large libraries—books, journals, etc.—onto the Web in a way that makes them fully searchable and readable.⁵⁷ Of course, many of these works are covered by copyrights, and at least some of the use by Google of such protected work would constitute infringement if not licensed by each owner. For this reason,

general interest, they are less motivated to get the proposed entity patented. *Cf.* *State St. Bank & Trust Co. v. Signature Fin. Group Inc.*, 149 F.3d 1368, 1375–77 (Fed. Cir. 1998) (holding business methods are not exempted from being patentable); Julie Creswell, *A Wall Street Rush to Patent Profit-Making Methods*, N.Y. TIMES, Aug. 11, 2006, at C7.

⁵⁵ See, e.g., Kara Swisher, *Technology (a Special Report): All Things Digital—Debating the Google Suit*, WALL ST. J., June 19, 2006, at R8 (describing the Google project and quoting Larry Lessig’s efforts to outline the project’s social benefits); Daniel Terdiman, *A Tool for Scholars Who Like to Dig Deep*, N.Y. TIMES, Nov. 25, 2004, at G6 (describing favorable reaction of academics to the Google project).

⁵⁶ Indeed, since the original five-library plan was established, the University of California has been added to Google’s project while Microsoft announced a competing program for digitizing the collection of the British Library. See Motoko Rich, *Arts Briefly: Google Snags Another Library*, N.Y. TIMES, Aug. 9, 2006, at E2; Robert A. Guth, *Microsoft to Offer Digitized Books of British Library*, WALL ST. J., Nov. 4, 2005, at B5.

⁵⁷ For a general description of the Google project, see Google, Library Project, <http://books.google.com/googleprint/library.html> (last visited Nov. 9, 2006).

Google and many of its supporters advocate expanding fair use or other privileges so that Google would not need to obtain licenses from the IP owners.⁵⁸

Whatever the virtues of the Google Library Project, the DNA-on-a-chip business model should be even more attractive to the relevant community of IP owners for a number of reasons outlined below. Plus, it will have potential life-saving consequences for society, which might assuage public resistance to any residual infringement or any sense that the proposed transaction is somehow being crammed down the throats of IP owners.

Like the Google Library Project, the proposed operating entity offers each IP owner a number of real, noncash benefits. First, the use to which the IP owner's subject matter will be put in both the Google project and the proposed DNA-on-a-chip transaction is a use that the IP owner itself would find very difficult to achieve otherwise—unless it employed what is in essence the same approach as the Google project or the one we propose in this Article. More specifically, both the Google project and the proposed entity provide a single pool of resources—an online library or a chip—in which somebody can search for the underlying IP—a copyrighted book or a patented DNA sequence—and such a single source for easy searching could only be achieved by bundling the assets. Second, for both the Google project and the proposed entity, the use by consumers of the library or chip, respectively, is likely to generate for the IP owner important information about other potential uses of its IP in a way that generates complementary sales and other business opportunities. For example, the complementary sales of the proposed entity discussed earlier⁵⁹ could be increased if the proposed entity maintains a Web page that is electronically searchable, as well as a set of links back to IP owners themselves. Analogously, the Google project “leads users to relevant book titles and then guides them to a library, the publisher or an online

⁵⁸ See Joan Rigdon, *Google, Books, and Fair Use*, WASH. LAWYER, Mar. 2006, at 21 (discussing the project's social benefits and the prospects for a more expansive approach to the doctrine of fair use to enable the project's implementation without mass copyright infringement or the incurrence of transaction costs to obtain the requisite licenses). To be sure, the proposed DNA-on-a-chip business entity is designed to operate in a way that will not constitute infringement because the IP rights will be licensed by the IP owners. Nevertheless, as mentioned previously, the proposed entity may follow a middle-ground strategy, discussed in more detail below in Part II.A, under which some infringement could occur briefly until settlements can be reached in those infringement actions that are brought.

⁵⁹ See *supra* notes 35–36 and accompanying text.

bookseller.”⁶⁰ That is, these projects provide several types of advertising: they increase general awareness, they provide specific information about the underlying IP and its value directly to interested users by aggregating information and making it easily searchable, and they direct those potential users directly to the IP owners. Likewise, the parallel Google Print Project provides consumers free referrals to a publisher’s products, thereby actually increasing demand for copyrighted material.⁶¹ Publishers have reported an increase in Website visitors and sales.⁶²

Unlike the Google model, the proposed DNA-on-a-chip structure provides the IP owners with two important forms of direct ownership in the project. First, the proposed entity provides each IP owner with a real cash payment.⁶³ Second, depending on how the proposed entity’s governance structure is organized, the IP owners also will have some degree of control over the entity. More particularly, in addition to some de facto control given their ability to at least threaten to hold out, the IP owners will have some type of express control through the votes they are issued. These rights to payment and control combine to give the IP owners a real ownership stake in the proposed entity, which should make the opportunity to participate even more attractive and further alleviate concerns that somehow the deal is being crammed down on them.

⁶⁰ Elisabeth Hanratty, iBrief, *Google Library: Beyond Fair Use?*, 2005 DUKE L. & TECH. REV. 10, ¶ 227, available at <http://www.law.duke.edu/journals/dltr/articles/PDF/2005DLTR0010.pdf>.

⁶¹ The Google Print Project is a joint effort between Google and publishers. The publishers choose which books are digitized and Google receives 50% of the revenue generated by its search function. See Ryan Edlings, Consumer News, *Publishers Fight to Stop Google's Library*, 18 LOY. CONSUMER L. REV. 266, 267 (2005) (discussing the Google Print Project).

⁶² In an on-line case study, Google cites the 124% increase in visitors and nearly 400% increase in sales for Print on Demand titles by the Penn State University Press. Google, Google Book Search Case Study, <https://books.google.com/partner/pennstate> (last visited Nov. 9, 2006). The increases have been attributed to participation in the Google Print Project. See generally Emily Anne Proskine, Note, *Google's Technicolor Dreamcoat: A Copyright Analysis of the Google Book Search Library Project*, 21 BERKELEY TECH. L.J. 213 (2006).

⁶³ At least at present it does not appear that the Google Library Project provides the copyright owner with any royalty payment. For a discussion of Google’s view on the legal issues relating to its project, see Jonathan Band, *The Google Print Library Project: A Copyright Analysis*, J. INTERNET BANKING & COM., Dec. 2005, <http://www.arraydev.com/commerce/JIBC/2006-02/Band.htm>.

II. ADDITIONAL OBSTACLES AND LIMITATIONS

The similarities that the proposed approach shares with the rough analogs discussed above buttress our belief that the proposed transaction is achievable in practice, as the other approaches are able to overcome many of the same sorts of obstacles and limitations that the proposed DNA-on-a-chip transaction likely faces. That said, we acknowledge that the proposed transaction faces some additional and unique obstacles and limitations. Some of the most serious of these are briefly discussed below.

A. *The Injunction Risk*

One of the most serious obstacles to the implementation of the proposed structure is the risk that an IP owner would proceed so far as to obtain an actual injunction, either based on a preemptive declaratory judgment action or as part of a regular infringement action brought after the entity begins operations.⁶⁴ A judgment-proofing structure for the operating entity that takes advantage of limited liability and the bankruptcy regime would operate to mitigate these threats by decreasing the economic pool available to an IP owner making the threat.⁶⁵ But a court-issued injunction is backed up by the contempt power of the court, which is a stronger sanction not blunted by a judgment-proofing structure because it puts at risk an entirely new pool of targets—individuals who face criminal sanctions.

Nevertheless, there are reasons the contempt power may not be invoked. First, without endorsing the U.S. Supreme Court's 2006 decision in *eBay v. MercExchange, L.L.C.*, about the availability of injunctions in patent cases,⁶⁶ we note that as a consequence of the Court's opinion, even if the operating entity is found to have infringed, the remedy may only be damages and not an injunction. Indeed, the extent to which many other IP owners have opted in to the proposed entity will be powerful evidence either that opting in is in the best interests of an IP owner in a way that should encourage a court to avoid an injunction or that the deal offered by the proposed entity is reasonable compensation in any damages calculation. Second, the con-

⁶⁴ As indicated earlier, the operating entity could exclude the holdout's DNA, but the structure does allow for the possibility that the entity may make the business decision to infringe or that the entity will infringe unintentionally.

⁶⁵ See *supra* note 24 for more on judgment proofing.

⁶⁶ See generally 126 S. Ct. 1837 (2006) (discussing when permanent injunctions are available in disputes arising under the Patent Act).

tempt power of the court is rarely, if ever, triggered on the court's own initiative. As a result, contempt proceedings are likely to be avoided unless the IP owner who has won the injunction elects to seek such additional court action. While an IP owner might elect such aggressive and expensive measures, the bringing of the action for the initial judgment and the proceedings seeking a contempt order combine to provide substantial delay. The proposed entity can use this delay time to better educate the holdout IP owner about the rational case for participation. This time delay will enable sufficient exchange of information and subsequent reflection by the IP owner to allow him to reach the decision to participate. In addition, during this time the holdout may face ongoing peer and social pressure to opt in.

Put differently, the transaction costs and delay associated with an IP owner's efforts to enforce its property rights can serve two often overlooked socially beneficial effects. First, transaction costs and delay discourage an IP owner from going full bore in enforcing its rights because it can be uneconomic to do so. Second, transaction costs and delay help IP owners and IP users coordinate with each other by providing the beacon effect needed to draw them together, the bargain effect needed to help them strike a deal, and the time needed to do both.⁶⁷ In other words, the costs and delay of continued litigation can actually increase the likelihood that the parties will strike a deal, especially once the scope of the dispute becomes clearer as the litigation starts to unfold and the zone of bargaining becomes more apparent.

B. *The Hostage Risk*

One of the most serious limitations on the practicality of the proposed entity ironically arises if the business becomes too financially successful. As indicated above, if the business is particularly profitable, its profits may be a sufficiently attractive hostage for a holdout IP owner to threaten. Not only might the IP owner have a greater incentive to hold out in an attempt to expropriate more value for itself; but when the value of the hostage increases as the operating entity generates larger profits, the operating entity, as well as the promoter and the licensor-IP owners, will face more pressure to accede to

⁶⁷ The beacon effect refers to the way an IP right can bring together all those interested in the commercialization of its underlying subject matter. The bargain effect refers to the way an IP right can help these diverse persons negotiate with each other once brought together. For more on these beacon and bargain effects, see Kieff, *supra* note 9, at 5, 13, 15-17.

the holdout's demands. In effect, this limitation restates the centrality of the structure's basic commitment to self-restraint as a coordination facilitator. The question of hostages has been touched on above in Part I.B.1, but some additional points are worth making.

One way to help ensure the requisite self-restraint is to structure the interests held by the IP owners so that they are a percentage claim on the entity's income and assets rather than a fixed amount. This can easily be achieved by structuring the operating entity as an LLC of which each licensor-IP owner is a member. This illustrates a more general point regarding how the proposed structure contemplates that the promoter and the licensor-IP owners will use transaction costs strategically to their advantage. If the licensor-IP owners simply had a fixed claim under a licensing agreement against the operating entity, such as a fixed dollar amount royalty, then it would be up to the operating entity and its management whether to give the holdout a larger piece of the pie, which would be increasing with the entity's profits. However, if the profits in effect are already committed to the licensor-IP owners as members of the LLC operating entity with an equity claim, then the licensor-IP owners in practice would have to agree to give the holdout a larger stake. Giving the holdout a preferred return would require restructuring the operating entity and its basic organizational and capital structure to create a new class of members.⁶⁸ Given the number of licensor-IP owners that are anticipated, as well as their interest in not giving up any of their stake in the enterprise, getting their sign-off to treat a new member specially would be impracticable.

The governance structure of the entity⁶⁹ and its economic arrangement thus will operate to undercut any hostage-taking strategy. The inevitable collective choice problems associated with getting members of the production team, including those having actual voting rights like the other IP owners, to go along provides an inherent check on the ability to restructure the deal in response to a holdout's demand. In effect, the promoter and the licensor-IP owners can use the organizational structure of the operating entity to credibly commit *not* to revise the deal in response to a holdout's demands.⁷⁰

⁶⁸ The LLC (or operating) agreement presumably would include a provision requiring the approval of its members to create new classes of members.

⁶⁹ Depending on business form, this governance structure will be embodied in an LLC (or operating) agreement, partnership agreement, or shareholder agreement.

⁷⁰ Such precommitment tactics are a well-known means of gaining an advantage in so-called "chicken" or "hawk-dove" games. One could conceptualize the promoter and licen-

Further, the entity's organizational documents may include some kind of express most-favored-nation ("MFN") clause that would give each IP owner the right to the same treatment as the most-favored IP owner. This right to equal treatment effectively undercuts the ability for any one IP owner to obtain preferential treatment because it makes granting any IP owner better terms too costly.

In sum, collective choice problems and MFN clauses work by building inflexibility into the deal, which means that the promoter, the operating entity's management team, and other relevant constituencies credibly can tell a holdout that their hands are tied and that they simply cannot give the holdout a better deal.⁷¹ As game theorists Avinash Dixit and Barry Nalebuff put it:

You might have thought that leaving options open is always preferable. But in the realm of game theory that is no longer true. Your lack of freedom has strategic value. It changes other players' expectations about your future responses, and you can turn this to your advantage. Others know that when you have the freedom to act, you also have the freedom to capitulate. To quote Oscar Wilde, "I can resist anything except temptation."⁷²

Or as Adam Brandenburger and Nalebuff explained: "[MFNs] are an instance of 'strategic inflexibility.' People often think that having more flexibility is one of those universally good things. It isn't. Sometimes you have more power when your hands are tied."⁷³

Another strategy, discussed earlier as a basic feature of the structure,⁷⁴ is for the entity to avoid accumulating title to assets. The entity likely needs only *access* to operating assets—plants, office space, equipment, etc.—not *ownership*. These assets can be rented from anybody, but because of the opportunity for complementary business opportu-

sor-IP owners' credible commitment to a nonnegotiable LLC agreement as a commitment to "drive straight" in a game of chicken, encouraging any holdout-IP owner to "swerve," which, in the context of the proposed deal, means to grant the operating entity a license. See AVINASH K. DIXIT & BARRY J. NALEBUFF, THINKING STRATEGICALLY: THE COMPETITIVE EDGE IN BUSINESS, POLITICS, AND EVERYDAY LIFE 119–67, 205–22 (1991) (discussing credible commitment and brinksmanship). For a classic work that bears on the analysis here, see generally THOMAS SCHELLING, THE STRATEGY OF CONFLICT (1960); see also generally ADAM M. BRANDENBURGER & BARRY J. NALEBUFF, CO-OPETITION (1996) (studying strategies players can employ to change the game to their advantage).

⁷¹ See BRANDENBURGER & NALEBUFF, *supra* note 70, at 161–69.

⁷² DIXIT & NALEBUFF, *supra* note 70, at 120.

⁷³ See BRANDENBURGER & NALEBUFF, *supra* note 70, at 165–66.

⁷⁴ See *supra* Part I.B.1.

nities discussed earlier, members of the proposed entity's production team may have sufficient interest in the entity's success that they are willing to rent their assets to the entity at more favorable rates.

Additionally, the operating entity could be run so that its net profits are relatively small, thereby further avoiding the existence of a potential hostage for a holdout to threaten. For good measure, the operating entity would be encouraged to pay out any profits it does earn in regular distributions to the promoter and the licensor-IP owners.

C. IP Owner Heterogeneity

We also recognize that there likely will be some diversity among the IP owners' contributions in a way that argues against treating them as entirely homogeneous. Some IP owners, for example, may provide a DNA sequence that everybody recognizes at the outset is more valuable than others. This triggers difficult questions about how to allocate different financial payoffs and control to each participating IP owner. Of course, the greater heterogeneity there is, the more difficult it will be to get all these deals done. Additionally, once the deal structure accommodates IP owner heterogeneity, flexibility is reintroduced into the transaction. There then would be room for the IP owner to claim it deserves a larger piece of the pie because its IP is "different," and the deal structure would presumably contemplate treating some IP owners on a preferred basis. For reasons explained above, this fuels the hostage risk. But the very logic of the underlying anticommons problem to which the proposed structure responds presumes a vast homogeneous pool of IP holders, as the anticommons problem generally presupposes considerable homogeneity. Put differently, if there really were a high degree of heterogeneity, which we think implies in most instances a manageable number of important players to negotiate with, then the important players could be dealt with using existing strategies and the remaining unimportant players could be omitted from the deal precisely because they are unimportant.

The precise details of different arrangements to address whatever heterogeneity exists will have to wait until actual deals are struck, and there are many reasons to think that any heterogeneity concerns can be resolved. Indeed, deals of all sorts get done when parties make very different types of contributions with very different valuations. That said, treating all IP owners the same regardless of their contribution ultimately may be the best option so long as IP owners have an incentive to opt in, as we believe they will even if they would prefer a larger stake.

D. Legal and Regulatory Risk

Finally, the proposed deal, like any other deal, faces general legal and regulatory risk. The regulatory landscape could shift so that the deal is prohibited or at least uneconomic. A court also could find that the transaction is illegal under current law. A particular risk with the proposed transaction, aside from antitrust scrutiny, is the risk that the veil of limited liability will be pierced, putting assets of the promoter and licensor-IP owners at risk.⁷⁵ The risk of piercing may be most acute if the operating entity is grossly undercapitalized or is seen as being established for the purpose of engaging in mass infringement.⁷⁶ We also recognize, however, that corporate structures designed to take advantage of limited liability are more routinely upheld by courts. We envision that the operating entity will have its own management team, will confer some control on the IP owners and will not simply be the promoter's alter ego, will respect corporate formalities, will not commingle funds with the promoter or any of the IP owners, and will be adequately capitalized to carry on its business. Further, the proposed transaction is designed to engineer a deal without mass willful infringement. In other words, the circumstances that generally must exist in order for a court to pierce should not exist in the deal as contemplated.

As with any deal, good faith and well-reasoned opinions of counsel presumably will have to be obtained as a condition to consummating the transaction. And even still, some parties may not have the gumption to participate in the proposed transaction. But this is a general risk and transaction cost that faces any new deal structure. If there is enough value on the table, parties will get comfortable with legal and regulatory uncertainty. After all, somebody always has to go first.

At bottom, the likely sweet spot for the proposed entity is a business that makes arrays of DNA on a chip where the pieces of DNA are each protected by a patent. This is a business in which there is likely to be general homogeneity and ex ante uncertainty among IP owners as to the value of each of their IP assets. It also is one in which, by design, there very well may not be huge profits available from the oper-

⁷⁵ See *supra* note 28 and accompanying text.

⁷⁶ See William P. Hackney & Tracey G. Benson, *Shareholder Liability for Inadequate Capital*, 43 U. PITT. L. REV. 837, 885-87 (1982); Robert B. Thompson, *Piercing the Veil Within Corporate Groups: Corporate Shareholders as Mere Investors*, 13 CONN. J. INT'L L. 379, 387-95 (1999) (discussing undercapitalization and parent-subsidiary cases). See generally Harvey Gelb, *Piercing the Corporate Veil—The Undercapitalization Factor*, 59 CHH.-KENT L. REV. 1 (1982).

ating business. But real value will come from using this technology to diagnose or segment populations into subpopulations that can be more profitably and more effectively treated in a targeted way. In such a case, large profits and large customer benefits are likely to be associated with complementary businesses, such as actual therapies and more focused diagnostics.

III. ON THE RISKS OF LEGAL REFORM

This Article's private ordering approach avoids several risks associated with the legal reforms that others may offer to avoid or mitigate the anticommons problem.⁷⁷ The risks of legal reform are private, borne directly by the potential participants involved in some transactions, but they also are social and borne by society in general. A full evaluation of the merits of the proposed structure as compared to legal reform requires an in-depth analysis of both the costs and benefits of these alternatives. The following discussion is offered just to introduce some of the costs the proposed structure is designed to avoid.

The risks associated with legal reform proposals are several. First, because the anticommons effect is so ill-defined, there is a serious line-drawing problem raised by any effort to target the problem with legal reform. For some, the problem is seen as triggered by too many upstream IP rights. But the nature of every upstream right is that it is associated with a corresponding downstream potential infringer. As a result, any potential infringer will always be able to make an anticommons argument. Second, the subjective nature of the anticommons effect thus gives rise to the risk that any government body charged with administering new rules responsive to the anticommons problem will be unduly influenced by some party claiming there is an anticommons. This sets the stage for a public choice problem, where in the name of decreasing transaction costs and monopoly effects agency decision making actually leads to the opposite result because big business will be better able to sway bureaucrats and political players than small business. When the key playing field is for control of legislative and regulatory bodies, it is unlikely that a start-up business will win the game of regulatory capture. Third, legal reform—whether it is achieved through new statutes, new rules and regulations, or new judicial doctrines—introduces uncertainty. The lack of certainty and predictability can frustrate business efforts and private contracting as

⁷⁷ See *supra* notes 13–14 and accompanying text for examples of proposed legal reforms to address the anticommons problem.

parties are unclear about who has what rights.⁷⁸ Finally, legal reform takes time to implement. In contrast, the private ordering approach outlined here can be pursued immediately.

IV. SOME IMPLICATIONS FOR IP THEORY

The type of private ordering approach offered here raises several implications for IP theory. Most obviously, its focus on coordination is tied closely to prior work by the present authors on the coordination/commercialization theory of IP.⁷⁹ The proposed structure provides yet another example of the way this theory helps those wanting to use the subject matter covered by IP at least as much as it helps the owners of IP. Put differently, the approach, which is designed to help a user avoid what otherwise would be a vast number of infringement suits, is a concrete, if not extreme, example of the way the coordination/commercialization theory of IP is not properly seen as being “pro-IP owners.”

The proposed DNA-on-a-chip transaction highlights the importance of allowing parties to order their affairs as they see fit against the backdrop of default rules rather than immutable rules. The importance of such flexible contracting has been addressed by the present authors in earlier work developing the so-called “basics matter” approach to analyzing IP transactions under the law.⁸⁰ One of the more important implications of the structure is that it provides a concrete example of how parties and their lawyers can engineer deals in creative ways to avoid the threat of myriad IP infringement suits while commercializing the IP to the benefit of society. In the few cases in which there is an act of infringement, the deal structure belies a conclusion that the infringement is willful—the entire enterprise is designed to avoid infringement by welcoming in all impacted IP owners—which significantly decreases the risk of enhanced damages and attorney fees. Thus, the proposed deal structure largely caps the downside risk of any residual infringement. To be sure, because the deal structure would likely crumble in the face of criminal liability, it and other private ordering approaches like it provide strong reason

⁷⁸ The authors have addressed the importance of certainty and predictability elsewhere. See F. Scott Kieff & Troy A. Paredes, *The Basics Matter: At the Periphery of Intellectual Property*, 73 GEO. WASH. L. REV. 174, 179–83 (2004).

⁷⁹ For more on this approach to IP, see generally Kieff, *supra* note 17; Kieff, *supra* note 9.

⁸⁰ See, e.g., Kieff & Paredes, *supra* note 78, at 179–83, 189–90; F. Scott Kieff, *Contrived Conflicts: The Supreme Court vs. The Basics of Intellectual Property Law*, 30 WM. MITCHELL L. REV. 1717, 1726, 1731 (2004).

for us to continue to keep the patent system free of the type of criminal sanctions that are available under the copyright system.⁸¹

Lastly, the approach offered here has serious implications for how the law of indirect infringement evolves. The 2005 U.S. Supreme Court decision in *MGM Studios Inc. v. Grokster, Ltd.*,⁸² which made clear that both forms of indirect infringement—inducement and contributory—are viable causes of action for copyrights as well as for patents, only highlights the need for more analysis in this area. This need is bolstered by recent concerns that inducement causes of action, especially under newly proposed legislation, could reach those financing and managing parties—such as banks and venture funds—that end up being direct infringers.⁸³ Similarly, within the context of the proposed operating entity, the promoters of such an entity might be targets in their personal capacities for a claim of indirect infringement to the extent the entity infringes the IP rights of any holdout IP owner.

We have elsewhere highlighted that causes of action for indirect infringement are designed to step in where the indirect infringer is causing the same economic effect as direct infringement.⁸⁴ Mark Lemley has recently argued that indirect infringement should be designed for cases where “the actual infringer either is not the truly responsible party or is impractical to sue.”⁸⁵ The structure this Article develops is somewhat consistent with the second of these two classes, but not the first. In fact, the approach offered here suggests the focus should be on an alleged inducer’s ex ante effect in facilitating or frustrating coordination. A private ordering solution to the public problem of the anticommons is a good case for a safe harbor. That is, rather than endeavor to judge the relative responsibility of the potential infringers (direct and indirect), the legal analysis that is more compatible with ex ante predictability and private ordering focuses

⁸¹ Cf. Copyright Act of 1976, Pub. L. No. 94–553, 90 Stat. 2541 (codified as amended at 17 U.S.C.A. § 506(a) (West 2000 & Supp. 2005)) (imposing criminal liability for copyright infringement in certain circumstances).

⁸² 545 U.S. 913 (2005).

⁸³ See generally *Intentional Inducement of Copyright Infringements Act of 2004: Hearing on S. 2560 Before the S. Comm. on the Judiciary*, 108th Cong. 123–24 (2004) (statement of Kevin S. McGuinness, Executive Director, NetCoalition) (expressing concern that “anyone who can be considered to be aiding, abetting, procuring, or inducing someone to engage in copyright infringement is subject to liability” and that “[v]enture capitalists [and] credit card companies . . . could find themselves the target of litigation”).

⁸⁴ See Kieff & Paredes, *supra* note 78, at 186.

⁸⁵ Mark A. Lemley, *Inducing Patent Infringement*, 39 U.C. DAVIS L. REV. 225, 228 (2005).

only on those acts that at the time conducted are likely to cause the same economic effect as direct infringement, which is to say frustrating coordination. Although this is not identical to Lemley's "impractical to sue" point when that determination is measured in the *ex post* world, it is designed to capture those efforts for infringement that *ex ante* are designed to work because they would leave only direct infringers who are impractical to sue. In the case of the private ordering solution to the anticommons problem, the proposed entity is instead facilitating coordination and therefore should be considered a desirable solution, and not appropriate for a judgment of indirect infringement.

CONCLUSION

The utility of any approach to problem solving depends on the circumstances of a given situation; different circumstances may warrant different solutions. Sometimes legal reform is appropriate. But sometimes private parties can overcome obstacles by finding creative ways to partner in an attempt to coordinate their activities and resources. Many people criticize lawyers as being part of the problem—as a transaction cost that clogs the system. Though this may be true at times, lawyers often are critical in getting things done.

This Article is in keeping with the literature that sees the role of lawyers as transaction cost engineers. This Article explores preliminary thoughts on a private ordering solution to the anticommons problem by focusing on both coordination and self-restraint in relation to property rights and commercial transactions. The details of the proposed structure would have to be negotiated in the context of an actual deal, but we are optimistic that the structure is workable in practice and not just in theory. We also are confident that the basic structure is viable beyond DNA-on-a-chip technology and could be applied in other contexts in which the anticommons problem arises. We do not at this point make the strong claim that the private ordering solution is necessarily preferable to legal reform, but offer it as a worthy alternative for evaluation and for its connections to the coordination/commercialization view of IP. Additionally, the proposal has some explanatory power for aspects of the legal doctrine of indirect infringement that are puzzling under other theories of IP. Finally, the proposed model shows some important ways in which the coordination/commercialization theory is not accurately viewed as being "pro-IP owners." While the DNA-on-a-chip transaction we propose benefits the business interests of the promoter and the licensor-IP owners, consumers also win as new diagnoses and treatments become available.