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ASYMMETRIC MARKET FAILURE AND PRISONER'S DILEMMA IN INTELLECTUAL PROPERTY*

Wendy J. Gordon**

I. PRISONER'S DILEMMA AND ASYMMETRIC MARKET FAILURE

Underlying many contemporary discussions of intellectual product regulation are two implicit economic models: one having to do with primary resource allocation, and one having to do with both allocative effects and administrative costs.¹ The implicit allocative model is what game theorists call the "prisoner's dilemma."² I have identified the model that implicitly addresses both allocative and administrative cost issues as "asymmetric market failure."³ My primary goal here is to explicate these two models. The more clear one is about underlying models, the easier it is to unpack them, show their virtues and inadequacies, and investigate the ways they should be supplemented.

As one example of scholarship that in whole or in part shows implicit reliance on these models I shall use the paper by Dennis Karjala prepared for this symposium.⁴ There is no need, however, to read the Karjala paper in order to understand my argument.

Although intellectual property law implicates issues that go well beyond economics,⁵ these two economic models are themselves important enough to merit identification and examination. In this short space, I will provide an introductory overview of each; for more de-

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1. In Guido Calabresi's now-familiar terms, these would be models addressing primary and tertiary costs, respectively. See GUIDO CALABRESI, *THE COSTS OF ACCIDENTS* 26-28 (1970).

2. See, e.g., MORTON D. DAVIS, *GAME THEORY: A NONTECHNICAL INTRODUCTION* 93-103, 109-14, 127-31 (1970); JAMES W. FRIEDMAN, *GAME THEORY WITH APPLICATIONS TO ECONOMICS* 66, 68-70 (1986); CHARLES GOETZ, *LAW AND ECONOMICS* 12-17 (1984); THOMAS SCHELLING, *MICROMOTIVES AND MACROBEHAVIOR* 110-15, 216-17, 231 (1978); Ken Binmore & Partha Dasgupta, *Game Theory: A Survey*, in *ECONOMIC ORGANIZATIONS AS GAMES* 1, at 24-26 (Ken Binmore & Partha Dasgupta eds., 1986).

3. See Wendy J. Gordon, *On Owning Information: Intellectual Property and the Restitutory Impulse*, 78 VA. L. REV. 149, 222-23, 230-38 (1992).

4. Dennis S. Karjala, *Copyright and Misappropriation*, 17 U. DAYTON L. REV. 885 (1992).

5. See, e.g., Wendy J. Gordon, *An Inquiry into the Merits of Copyright: The Challenges of Consistency, Consent and Encouragement Theory*, 41 STAN. L. REV. 1343, 1435-69 (1989) (exploring limitations of the economic approach and suggesting alternative or supplementary normative approaches).

tailed treatment of the issues raised, the reader should refer to the work of myself and others as cited below.

II. ASYMMETRIC MARKET FAILURE

The first model is asymmetric market failure. I argue that the best economic case for intellectual property can be made out when asymmetric market failure is present.⁶ Asymmetric market failure exists when two events or conditions converge. The first condition is that authors and inventors would not be able to obtain much payment for their work in the absence of a rule that restrained strangers from copying, and, as a result, potential creators produce fewer works than the public would have been willing to pay for.⁷ In other words, the first condition is that creators and their potential customers would face a market failure in the absence of a legal rule that requires copyists to seek permission and pay license fees.

The second condition for asymmetric market failure is that once a no-copy rule is put in place, licensing will evolve. In other words, this second condition is met if, in the presence of a copyright or some other rule restraining strangers from copying, markets will succeed, not fail.

One reason to call the confluence of the two conditions “asymmetric” is because where they obtain, authors face a market barrier that copyists do not. In a world where lack of legal restraint on copying leads to market failure, authors cannot easily get paid. Yet if in a world that *has* copying restrictions copyists can form markets, they are not stymied. Rather, licensing evolves.

The first condition, that authors face market failure in a world without copyright, is important because its presence indicates that legal intervention may be required to provide adequate incentives for production. If in the absence of a no-copy rule a potential creator would expect competitors to copy her work and undersell her, she may refrain from creation in the first instance, so that the public receives less creative work than it really would be willing to pay for. It is this kind of market failure, sometimes identified with the “public goods” characteristics of intellectual products (particularly nonexcludability), that copyright and patent are intended to cure.⁸

6. See Gordon, *supra* note 3, at 222-23, 230-38 (presenting asymmetric market failure and describing its economic bases). Asymmetric market failure also has roots in corrective justice. See *id.* at 180-221. However, investigating that aspect would take us too far afield.

7. If a potential customer believes she can obtain a resource for free, she is unlikely to pay anything for it, even if she would have been willing to pay a significantly high price for it if that were the only way to obtain the resource.

8. For a fuller explanation of how copyright is intended to solve an initial market failure, see Wendy J. Gordon, *Fair Use as Market Failure: A Structural and Economic Analysis of the*

Thus, when it is asked, why have copyright or any other intellectual property rules in the first place, the usual economic answer is that without these doctrines it is hard to exclude free riders.⁹ This economic answer does not presuppose that authors want to prevent the public from seeing or reading their work; far from it. Rather, authors typically desire wide dissemination of their work, but want the public to *pay* for the access they receive. To give authors bargaining leverage with which to extract fees, the law provides them a right to exclude¹⁰ that functions in much the same way as do fences, or real property's rights against trespass: These rights give owners an ability to bar certain uses of their creative work and thus gives them the ability to extract a price from those who wish to so use the work.¹¹ Thus, proponents of copyright typically claim that without legal protection a creator will have great difficulty in excluding nonpayers,¹² and the first condition in asymmetric market failure addresses whether this asserted difficulty is in fact present.

The policy implications for new or extended intellectual property rights is clear: If an authors' group wishes to have a court or legislature make new rules against copying, it should be prepared to show that their current fences are insufficient to provide adequate incentives.¹³ In

Betamax Case and its Predecessors, 82 COLUM. L. REV. 1600, 1602-14 (1982) (discussing copyrights and markets; the "public goods" problem).

9. As an example of the difficulty in excluding nonpayers from certain intellectual products, consider that once a book or a piece of music is put on the market it can be easily copied.

Another public goods characteristic of intellectual products is nonexhaustability. This refers to the fact that, typically, many people can make simultaneous use of a product (e.g., all may be reading the same book or listening to the same radio program) without depriving others of their use. Because of nonexhaustability, no flawless economic solution to intellectual product regulation may exist. In the abstract, combining copyright with perfect price discrimination might be such a solution. See Harold Demsetz, *The Private Production of Public Goods*, 13 J.L. & ECON. 293, 300-06 (1970). However, perfect price discrimination is not practicable. Thus, copyright does not "solve" for the nonexhaustability characteristic; in fact, copyright imposes deadweight loss precisely because some people who value a work at a price above its marginal cost of production may be denied access to it. Nevertheless, the deadweight loss is thought appropriate to bear as an unavoidable byproduct of creating necessary incentives so long as the losses imposed by the intellectual property system are less than its benefits. See note 14 *infra*.

10. See 17 U.S.C. § 106 (1988) (a copyright owner is given exclusive rights to, e.g., reproduce the work, publicly perform it, and make derivative works adapting it).

11. See Gordon, *supra* note 5, at 1354-94 (parallels between intellectual property and real property).

12. Conversely, scholars who are critical of copyright, or who doubt the wisdom of its expansion, typically argue that copyright is not necessary for creators to obtain payment for their work. See Stephen Breyer, *The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies, and Computer Programs*, 84 HARV. L. REV. 281, 350 (1970); Tom Palmer, *Intellectual Property: A Non-Posnerian Law and Economics Approach*, 12 Hamline L. Rev. 261 (1989).

13. The instant treatment is an overview. In a fuller treatment, this asymmetric market failure test could profitably be further refined. For example, some authors produce for reasons unrelated to monetary incentives; for such authors, copyright may be unnecessary to encourage

other words, to make a good economic case for intellectual property in an area, the facts should suggest that a potential creator *needs* the courts to act on her behalf, and could not receive adequate compensation¹⁴ for her work otherwise. If the desired incentives could be forth-

production of new creative work. Even for such authors, however, copyright may be necessary to facilitate or organize post-creation dissemination of the work; for example, copyright might enable an author to find a publisher, and give the author and publisher the security necessary for them to invest in reproducing and marketing the work. See Edmund Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265 (1977).

Another potential refinement is to compare the costs of fencing (by which I mean a combination of self-help and common-law tort and property rights) with the costs of explicit legal protection of intellectual products. My text assumes that fencing is usually less societally costly than is adopting an intellectual property regime, both in terms of administrative costs and dead weight loss. But if a policymaker were able to compare the costs of the two modes of providing incentives, and if she were to decide that fencing was in fact more expensive than setting up and enforcing a system of intellectual property rights, that might justify adopting a copyright-like law even in the absence of author market failure. Of course, such a decisionmaker would have to face other issues as well, such as the distributional question of whether it is appropriate to relieve producers of much of the cost of capturing user payments and instead place more of such cost on the public. In addition, legal prohibitions against copying pose noneconomic dangers that private modes of fencing-off do not, such as creating in the user population a perception of governmental compulsion, which could give rise to a species of resentment; in addition, such legal protection is probably more likely to create a chilling effect that might impede the creation of new works. Thus even if a decisionmaker could compare the costs of intellectual property protection versus fencing, and even if she determined that fencing was more costly to administer in monetary terms, there still would be reasons to hesitate before enacting an intellectual property system.

An additional avenue worth exploring is the possibility of achieving low-cost internalization through a *mixture* of approaches, combining explicit intellectual property protection with other modes of fencing off intangible products from nonpayers. For example, in particular circumstances the lowest-cost route to achieving incentives might be to combine copyright with self-help devices, such as secrecy, lead-time advantage, or mechanical barriers (e.g., scrambling of television broadcasts, or embedding copy-protect devices in software), along with ordinary common-law remedies such as rights against trespass.

As mentioned, the analysis in the main text assumes that fencing is societally less costly than legal protection; if enacting intellectual property rights would encourage producers to rely primarily on the law and largely abandon their self-help efforts—which could happen, since governments subsidize the enforcement of legal rights, freeing those who employ legal remedies of much of the actual cost—then it would be unnecessarily costly to enact intellectual property rights. But it is also possible that in the absence of property rights, producers would *over-invest* in self-help, spending more to keep nonpayers away than is socially optimal. If that occurred in a given area or business, and if enacting intellectual property protection would discourage such over-investment, then it might be desirable to create intellectual property rights for the area—so long as, in the process of making intellectual property remedies available, the law did not encourage *under-investment* in self-help.

Trade secret law exhibits such a mixture of legal protection and self-help. It even contains a feature that guards against producers' abandoning their investment in self-help efforts: trade secret law only grants legal rights to plaintiffs who have maintained, as a factual matter, a certain degree of secrecy. Copyright and patent contain no equivalently strong method of preserving producers' incentives to fence.

14. The argument does not assume that the author should be entitled to be paid for *any* use of her work; how much monetary incentive should be provided is a complex question. The value of any new works brought into being by the incentives of an intellectual property system must be weighed against the deadweight loss and administrative costs of the system. See William M.

coming even *without* an intellectual property rule in place, it is probably wasteful for the courts and legislature to become involved.¹⁵

Thus the first condition of asymmetric market failure addresses whether an intellectual property system is needed in the first place. The second condition for asymmetric market failure addresses whether the intellectual property system will be practicable, and really provide the incentives desired.

As mentioned above, this second condition is that users under copyright would not face market failure—that under copyright, markets would evolve. This consideration is also clearly relevant to incentives, for monetary payments will not come to creators unless potential users are able to bargain around the law's restrictions and pay for licenses or copies.

No matter how otherwise desirable it may be to have a copyright, patent, or misappropriation system, the arguments in favor of that system from an economic perspective are empty unless markets come into being. Without markets in which to sell their work, the people who own the intellectual products will be unable to obtain fees, they will therefore lack incentives, and as a result fewer new works will come into being. In addition, unless markets are forthcoming—a publisher who contracts to manufacture and distribute copies, a movie maker who is licensed to adapt a book—the public will be denied even the use of the intellectual products that *have* been made. This observation has implications for policy: if a defendant faces market failure in the face of copyright, that is a good argument (if not a complete one) for not enforcing the copyright against him, for in his case, the economic foundation for copyright has crumbled.¹⁶

If markets do not evolve for a particular creative work or use—say for example that bargaining is impeded by problems such as externalities, high transaction costs, or the impossibility of identifying the copyright proprietor—and no market substitutes (e.g., Coasian firms, compulsory licenses) are available, then if the copyright laws prohibited copying in that area it would simply be preventing copying without yielding creators any monetary advantage. That would be undesirable.

Landes & Richard A. Posner, *An Economic Analysis of Copyright Law*, 18 J. LEGAL STUD. 325, 326 (1989).

15. Should circumstances suggest, however, that authors' alternative modes of capturing compensation are undesirable in terms of administrative costs or other considerations, it would be in order to perform a fact-sensitive comparison between the costs of an intellectual property system and these alternative means of providing incentives. See note 13, *supra*. The second half of the asymmetric market failure test, see immediately *infra*, speaks to the administrative cost issue.

16. This analysis, I have suggested, explains much of the caselaw decided under copyright's "fair use" doctrine, which privileges certain uses by defendants that would otherwise be treated as infringing. See Gordon, *supra* note 8, 1614-15, 1627-41.

Not only would copyright then fail to perform its primary function, but if users cannot reach market deals with creators, copyright would impose *more costs* and generate *less benefit* than would a regime without copyright. For though incentives may be low in a world without copyright, at least copyists and other users would have access to whatever works happened to be created; by contrast, in a world where there is copyright but no markets, incentives are low *and* the public has little access. Therefore, the ability of users to form markets is crucial to copyright's economic mission of encouraging the production and use of new work.

Karjala seems to find such an approach congenial, at least in part.¹⁷ Karjala's paper sometimes implies that the more likely a creator is to be willing to license, the more can be said in favor of giving that creator a right to forbid nonconsensual copying.

The ability of users to form markets under copyright is also important for another reason: administrative costs. Let us say that after having supposedly cured the first market failure—the author's difficulty in excluding nonpayers—by setting up a system of intellectual property rights, Congress decides to cure any secondary market failures that arise that could block licensing of the copyrighted works. Perhaps transaction costs block licensing in a particular entertainment industry, and the legislators cure the market failure by setting up a scheme like compulsory licensing, or by explicitly authorizing courts to give continuing damage remedies; in cases like that, the law is "making a market" of sorts. For example, the compulsory licensing scheme may eliminate bargaining difficulties by imposing a mandatory license fee, and the fee becomes the "price." Similarly, a court that allowed an infringing use to continue while awarding a damage remedy or a reasonable royalty would basically be setting up a compelled license.¹⁸ Such market substitutes act as markets do, simultaneously enabling the public's use to go forward and directing compensation toward the creator.¹⁹

But these schemes are likely to be much more expensive and cumbersome than ordinary markets are.²⁰ Further, since their administrative costs are high, there will be gaps in coverage; such market-substitution devices will not be set up wherever their administrative costs

17. See generally Karjala, *supra* note 4.

18. The courts may be edging toward the use of "damage only" remedies in certain copyright cases. See, e.g., Hon. James L. Oakes, *Copyrights and Copyremedies: Unfair Use and Injunctions*, 18 HOFSTRA L. REV. 983 (1990) (suggesting that free speech principles should be relevant to the grant or denial of injunctive relief in fair use cases even if monetary relief is granted).

19. See Gordon, *supra* note 8, at 1622-24 (noninjunctive remedies as an alternative to fair use).

20. *Id.* (examining issues, such as comparative institutional competence, bearing on whether judicially-imposed monetary remedies are a feasible response to market failure).

outweigh the benefits of a given license. These devices are also likely to be imperfect market mimics, for nothing calls forth accurate revelation of preferences and costs like a real bargaining situation does. Therefore, for example, even as to a class of uses covered by a compulsory license scheme, some of the particular uses that would occur in a perfect market will not happen.

Considering the administrative costs of these market substitutes, it may be that an intellectual property regime that faces significant market barriers will not generate enough economic incentives to be worth pursuing *even if* the lawmakers are committed to surmounting those barriers. Not only might the administrative costs cancel out much of the incentive gains, but incentives themselves may be low because some potential uses will remain unexploited.

So where does all this leave us? I argue that intellectual property rights *are most easily justified* from an economic perspective when the two conditions of asymmetric market failure converge—where intellectual property is necessary to cure a market failure faced by authors, and where, after the law adopts an intellectual property system, users do not face market failure in their search for licenses. Under such conditions, the allocative gains for an intellectual property system are likely to be high, and the administrative costs of the system are likely to be low.

III. PRISONER'S DILEMMA

A. *Interconnection Between the Models*

The second model to be discussed is the most well-known model in game theory: the prisoner's dilemma game. Before describing the game, it will be useful to explain how this second model is related to the previous discussion.

As presented above, the first prong of my asymmetric market failure test addressed the question of whether intellectual property is really necessary to provide adequate incentives. Commentators like Stephen Breyer and Tom Palmer have suggested there are situations in which authors can obtain payment even without a copyright system in place,²¹ and debate today often centers on the extent to which intellectual property protection is really necessary in various industries.

The second part of this essay begins the task of examining when an intellectual property system is likely to be necessary by identifying when authors without copyright are most likely to face significant market failure. To do so, it makes explicit the underlying structure of a

21. See discussion *supra* note 12 and accompanying text.

central argument advanced by advocates of intellectual property protection.

When commentators wish to describe situations in which the economic need for legal intervention appears strong, they commonly describe situations in which the creator faces competitors who are able to copy the work at low cost and who are able to sell the copies at a lower price than the creator can because they have no need to cover the costs of creation; as a result, it is argued, the copyists drive the creator out of business, and in so doing generate disincentives for future production. Dennis Karjala makes an argument of this sort.²² As will appear, these hypothesized situations generally conform to the dynamics of the prisoner's dilemma game.

Thus, to tie the two parts of the discussion together—an advocate of intellectual property protection in a given context will want to show that without such protection, creators would face market failure that would erode their incentives to create. The prisoner's dilemma, when present, arguably presents a set of powerful incentives *not* to create. If it indeed creates such disincentives, then the presence of a prisoner's dilemma makes out a good case of author market failure.

B. *The Game*

Game theory essentially investigates how rational actors would behave under a variety of specified constraints, usually consisting of a pattern of "payoffs" that each player will receive from a particular configuration of player choices. The closer the constraints of a given game conform to real-world conditions, the more helpful the game will be in predicting real-world behavior, and the more useful the experiments in changing the payoffs of that game will be in yielding information about changing behavior.²³

Although the prisoner's dilemma is somewhat out of favor today,²⁴ it is the game which has probably had the greatest influence on legal

22. See discussion *infra* note 43 and accompanying text (discussion of Karjala position).

23. Thus, as Binmore and Dasgupta note:

It is a major and fundamental error to take it for granted that, because certain cooperative behavior will benefit every individual in a group, rational individuals will adopt this behavior [Rational] individuals will act *strategically* and hence implement an *equilibrium* in the game. The basic problem in the design of games is therefore to construct games whose equilibria have desirable properties. As such, [game theory] can be seen as a branch of applied economic theory.

Binmore & Dasgupta, *supra* note 2, at 24 (emphasis in original).

24. Among other things, there has been a reaction to those over-enthusiastic defenders of private property who seem to have used the prisoner's dilemma approach to suggest that commonly-owned or unowned resources will inevitably lead to tragic overuse. Whether private property will lead to better resource allocation is, of course, a matter of the particular circumstances. See, e.g., Carol Rose, *The Comedy of the Common: Custom, Commerce, and Inherently Public*

scholars. It is a game where *each* of the two participant players is likely to be better off if she is empowered to join with the other to constrain their mutual choices, e.g., by law, than she is likely to be when both are at liberty to respond to the initial payoff pattern as unconstrained individuals. The prisoner's dilemma pattern accordingly is used both to explain and to justify certain legal constraints: (1) if unconstrained incentives in a particular context would lead to mutually destructive behavior, the introduction of legal constraints into that context can be understood as a rational way to increase aggregate productivity; and (2) if the constraints also serve the parties' individual long-run interests, then each party may be viewed as having given "implied consent" to the constraints—even if in the short run one of the parties finds them irksome.²⁵

The game receives its name from the heuristic commonly used to illustrate it. Imagine two prisoners who had joined together to pull a heist.²⁶ The prosecutor has some evidence against each, but not enough to be conclusive on the severest charge that the acts of the two would warrant. Say that if both stay silent—denying the prosecutor any additional information—each can expect a short jail term of eighteen months. Each prisoner is individually approached by the prosecutor with this deal: If she "rats" on her pal and the pal stays silent, the prosecutor will dismiss the charges against her and use the proffered information to convict the pal for the maximum term of nine years. Conversely, the prosecutor tells each that if she refuses to "rat" and the other prisoner "rats," she will go to jail for the maximum term. If both "rat," the prosecutor says he will use the information against each, but, in return for their forthcomingness, he says he would then send them to jail for only a moderate term, say five years. What often happens in plays of the game is that both players "rat"—leaving both worse off (in jail for five years) than if they had cooperated with each other and stayed silent (in jail for eighteen months). To avoid this result it would be necessary to change the payoff structure—something which law can do.

For example, if a prisoner could sue in tort for any harm a partner's "ratting" does her, "ratting" would become less attractive; simi-

Property, 53 U. CHI. L. REV. 711 (1986) (suggesting that public access to certain types of land is as desirable as is privatization of other types of land).

25. I use the term "implied consent" loosely, to identify any of the many types of argument that take as their goal satisfying some need, preference or right of the persons to be affected by the legal rule in question. Cf. Hanna Pitkin, *Obligation and Consent - I*, 59 AM. POL. SCI. REV. 990 (1965); Hanna Pitkin, *Obligation and Consent - II*, 60 AM. POL. SCI. REV. 39 (1966) (locutions of "consent" in Locke and other writers interpreted as referring to whether a government *deserves* consent, particularly in terms of whether it serves the welfare of the governed).

26. See sources cited *supra* note 2.

larly, if prisoners could form enforceable contracts not to “rat,” they would likely enter into such contracts in order to make crime more profitable. Of course, the law does not want to discourage criminals from confessing and implicating each other.²⁷ But the game can be generalized well beyond the prison context to places where it *is* desirable to enable people to constrain their choices—as by allowing them to enter into binding contracts, or by adopting rules of property or tort—so they will do things that yield maximum benefit for themselves.

To formalize for a moment, it will be useful to draw a matrix showing the payoff pattern that constitutes the classic prisoner’s dilemma. I am here using the symbolic matrix as presented by Charles Goetz.²⁸

Assume there are two players, A and B, and that the matrix depicts the payoff (either reward or penalty) that will come to A as a result of the choices she and B make. Across the first horizontal line would be the payoff player A will receive if she cooperates with the other player; across the second horizontal line would be the payoff she receives if she defects, or “rats.” Since A’s payoff for cooperating or defecting will vary depending on what the other player does, the matrix also needs vertical columns to show how her payoffs would be affected by the choice that the other player makes. In the first vertical column would be A’s payoff if the other player cooperates, that is, her payoff if he keeps silent. The second vertical column shows A’s payoff if the other player defects, that is, her payoff if he “rats.” Assume that A’s payoff structure is symmetrical with B’s, and that B’s matrix would be a mirror image of this one.

Pattern of A’s Payoffs:

	<i>If B cooperates</i>	<i>If B defects</i>
<i>If A cooperates</i>	<i>a</i>	<i>c</i>
<i>If A defects</i>	<i>b</i>	<i>d</i>

In the prison version of the game, cooperate/cooperate means that both stay silent and both go to jail for the short term of eighteen months. So “a” equals a year and a half in jail (or “minus one and a half” for a convenient numerical equivalent) in that version of the game. The payoff for a prisoner who defects (“rats”) when the other is cooperating by keeping mum, is “b,” which in the prisoners’ context is equivalent to going free—a very high reward. Therefore, “b” equals

27. Thus, one reason the law might not allow a binding contract of silence between two criminals in jail would be a desire not to change their payoff structure in this regard.

28. See GOETZ, *supra* note 2, at 12-17.

zero years in jail. When a player cooperates but the other is defecting, the cooperator reaps "c"; in the prisoner context "c" is the highest sentence of nine years (numerically, minus nine). The fourth alternative "d," where both players defect, is equal in the prisoner's context to the moderate term of five years (minus five).

Formally speaking,²⁹ the constraints of the prisoner's dilemma are that "b" is greater than "a" (as zero is greater than minus one and a half); "d" is greater than "c" (minus five is greater than minus 9); "a" is greater than "c" (minus one and a half is greater than minus 9); "b" is greater than "d" (zero is greater than minus five); and "a" plus "a" (yielding a total of minus three) is greater than the sum of any alternative pair of payoffs the two players could achieve. Basically these formal constraints mean that, for any one play of the game, both parties may be led to defect in a context where mutual defection makes them both worse off than would mutual cooperation; defecting is the dominant strategy; and had they both cooperated, the aggregate welfare of the pair would have been higher than it could be under any of the other options the circumstances leave open to the players.

In intellectual property terms, creating one's own work would be the "cooperative" option, and copying would be the "defect" option. A prisoner's dilemma situation would result if there were two parties, each a potential creator or a potential copyist,³⁰ who faced the following set of circumstances. Assume that:

(a) Creation of a new work is expensive, but copying is cheap. A copyist will bear some costs a creator would not, because of the copyist's comparative inexperience and lack of expertise, but the sum of these costs plus the cost of reproduction are much less than the cost of initial creation plus the cost of reproduction.

(b) Investing in the creation of a new work will more than pay off its investment, so long as no copying occurs.

(c) If copying occurs, the creator will lose all his investment. This is likely to happen if the copyist, being free of creation costs, can charge less for the product than the person whose efforts first produced it. If the creator and copyist products are identical,³¹ it is assumed that consumers will purchase the cheaper one.

29. The following is based on GOETZ, *supra* note 2, at 16-17.

30. I am assuming here a fully parasitic and noncreative copyist.

31. Of course, one of the lively arguments in intellectual property is whether, because of audience loyalty or other factors, the two will not in fact be seen as identical. *See, e.g.* Landes & Posner, *supra* note 14, at 329-33 (practical obstacles that limit copying).

If these circumstances are present, they in turn provide the following payoff structure:³²

(1) If both parties opt to create their own works independently, both reach their own audience and both prosper. Their payoff is that each makes a profit of \$100. This is "a" on the matrix.

(2) If both parties opt to be copyists, there will be nothing to copy. Their payoff is \$0 each. This is "d" on the matrix.

(3) If one party creates and the other copies, the creator loses his investment, a payoff of *minus* \$450, and the copyist makes a large profit of, say, \$470.³³ So had the party we are looking at chosen to be a copyist in circumstances where the other party had chosen to be a creator, her payoff—in box "b"—would be \$470 in profit. Had the relevant party chosen to be a creator in this configuration, and had the other chosen to copy, the creator's payoff—in box "c"—would have been *minus* \$450.

Note that the formal conditions are met: "b" (470) is greater than "a" (100); "d" (0) is greater than "c" (-450); "a" (100) is greater than "c" (-450); "b" (470) is greater than "d" (0); and "a" plus "a" (100 + 100 = 200) is greater than any other joint product possible under the scenario given.³⁴

In the circumstances set out above, choosing not to be a creator becomes the dominant strategy. The reason is clear. There is a huge potential loss associated with creating and a huge potential gain associated with copying.³⁵ Both may opt to be copyists. After all, zero payoff is better than losing one's shirt. Yet had both been creators, they would be better off—as would society, their potential customers. To cure this situation, the law creates anti-copying rules, in the form of doctrines

32. The numbers chosen are illustrative; it is the relationship between them, not their particular values, that is important.

33. I assume the copyist makes this profit on the basis of the following: Since he sells at a lower price, he may make not quite as much in gross revenue as the creator would have even though he may sell to more customers. His net will be much higher, however, since he is free of creation costs. The creator's gross revenue (say \$550) minus creation and other costs is assumed to yield her \$100; the copyist, not having to bear creation costs, and charging somewhat less, is assumed to have a preliminary net yield of \$485. From this I have deducted \$15 (485 - 15 = 470) to account for the costs the pirate must bear which the creator would not have had to bear; these are attributable, perhaps, to the copyist having a less effective manufacturing or distribution system than the creator did—after all, the copyist has to learn things the plaintiff already knows, the copyist has less experience and connections in marketing, and so on.

34. If both defect, i.e., neither creates new work, the sum of "d" plus "d" is zero. (Note these payoff figures ignore the opportunity costs of investing in creative activity.) If one creates and the other copies, the sum of 470 and *minus* 450 ("b" plus "c") is twenty. The payoff from "a" plus "a," 200, is bigger than either of these alternative joint payoffs.

35. Even if one *wanted* to create, there is a scary outcome, (the loss of \$450), that may eventuate; given the temptation of copying's high profit level, the likelihood that a copyist will be present is large.

such as copyright, patent, and misappropriation.³⁶ These legal regimes alter the relevant payoffs; copyists reap infringement suits instead of huge profits. As a result, it is argued, the law's prohibition on copying discourages copying and encourages investment in creative activity.

In its original form, circa 1790, American copyright tracked the prisoner's dilemma model quite closely. Authors essentially were protected only in what were their primary markets against persons whose sales would be most likely to undermine the authors' incentives. There was no right to control performances of one's work or public displays of that work; also, most important for the purposes of the instant discussion, there was no right over the making of derivative versions³⁷ of one's work. Even abridgements were non-infringing so long as they were "bona fide" abridgments addressing a different market than the plaintiff's.³⁸ In fact, *Folsom v. Marsh*,³⁹ an early abridgement case, helped give rise to the doctrine known today by the label "fair use." This is fitting because fair use is practically the only copyright doctrine where current law shows special solicitude for the *creative* defendant. Today the creative copyist is most likely to be treated as an ordinary infringer.

The most obvious illustration of this is that copyright today grants authors extensive rights to control the making of derivative works.⁴⁰ As a result, it protects creators in situations where no prisoner's dilemma is present. For example, where a copyist is making a creative use of a creator's book in an unexpected and noncompeting field,⁴¹ the costs of copying are high; therefore, the payoff from copying (box "b" on the matrix) is not likely to be extraordinarily high. Also, the original author is likely to face no unexpected losses in the sales of her book. On the contrary, her book sales are likely to rise if the new use garners publicity. Therefore, the payoff from being copied (box "c") is not likely to be negative. Nevertheless, the potential adapter of the work

36. This is essentially the explanation I proffer for the case of *International News Service v. Associated Press*, 248 U.S. 215 (1918). See Gordon, *supra* note 3, at 266-73 & n.446. A good argument can be made, however, that much of the caselaw decided under the misappropriation rubric should be pre-empted under current law. See *id.* at nn. 21-22 (arguments against and for pre-emption of state fact protection).

37. Copyright Act, ch. 15, 1 Stat. 124 (1790) (giving certain classes of authors exclusive rights of "printing, reprinting, publishing and vending").

38. *Folsom v. Marsh*, 9 F. Cas. 342 (C.C. Mass. 1841) (No. 4,901).

39. 9 F. Cas. 342 (C.C. Mass. 1841) (No. 4,901).

40. 17 U.S.C. § 106(2) (1988).

41. For example, where a producer uses the plot of a novel as the basis of an experiment in a new art form, this is an infringement regardless of whether the novelist wished to exploit this avenue and regardless of whether she planned on license fees from this new market as part of the projected revenue stream that made the investment in the book appear worthwhile.

must bargain for the adaptation rights or face the author's puissant wrath in court.

The reasons for Congress granting this expansive set of rights may be economic or may be tied to the same notions of personality as arguably underlay the Supreme Court's preference for "creativity" in *Feist Publications, Inc. v. Rural Telephone Service Co.*⁴² While I offer no opinion on that aspect of *Feist*, the fact remains that the Copyright Act gives protection far beyond the "pure piracy of investment" situations exemplified by the prisoner's dilemma model. That such piracy is not necessary for copyright protection today suggests that current copyright is influenced by other concerns—and that there may be some particularly contemporary merit to the Court's holding that "piracy" of an investment in valued labor is not a sufficient basis for invoking the Copyright Act's extensive grant of rights and remedies. A concern with piracy may be part of copyright, but the two are simply not coterminous.

Karjala argues that copyright should make all acts of "piracy" infringements, regardless of the creativity of the work that is pirated.⁴³ By "piracy" Karjala seems to have in mind something like the classic prisoner's dilemma, for most of the examples Karjala gives where he sees "piracy" and therefore favors liability, several circumstances that resemble the model conjoin. There are two competitors. One is a creator whose investments in creativity are high; one is a copyist who copies at low cost and undersells the creator. The creator is ruined and the prospect of such events deters creation *ab ante*. This looks remarkably like the prisoner's dilemma pattern outlined above. But however consistent with copyright's 1790 scope Karjala's proposal might be, the proposal does not sit easily within current copyright law. Clearly, that is something he already recognizes, but I find it troubling to mix the two kinds of approaches as freely as his suggestion might lead us to do.

C. *Implications of the Prisoner's Dilemma Analysis*

What is the importance of prisoner's dilemma? For one thing, it suggests why so many scholars have insisted on keeping competition between the parties a prerequisite for suit under misappropriation law: When competition between parties is absent, so is the prisoner's dilemma payoff structure which is so destructive to incentives.⁴⁴ The pris-

42. 111 S. Ct. 1282 (interim ed. 1991). In *Feist*, of course, the Supreme Court ruled that noncreative compilations of fact were not entitled to copyright, regardless of the labor that had gone into their development. *Id.*

43. See generally Karjala, *supra* note 4.

44. See Gordon, *supra* note 3, at 222-23, 238-48 (competition as a requirement for misappropriation).

oner's dilemma analysis also suggests explanations for other areas in the law of intellectual product regulation. For example, it suggests legal rights might only be needed where the costs of copying are low. That is one potential explanation for why trade secret law permits reverse engineering—it is an instance where costs of copying are likely to be high, so that the kind of temptation that can lead to a destructive prisoner's dilemma spiral may be absent.

More generally, the prisoner's dilemma game suggests one set of questions a policymaker should ask about the real world: Are the various matrix conditions satisfied (for example, is "a" plus "a"—the payoff from joint cooperation—greater than any other possible joint product? Is defection the dominant strategy?)⁴⁵ so that potential creators face perverse incentives in the area where new rights are being sought? These questions must be asked before supporting an extension of intellectual property rights to alter the prevailing incentive pattern. The absence of a prisoner's dilemma situation means the policymaker should be more suspicious about claims that market failure justifies judicial or legislative interventions.

Nevertheless, the importance of prisoner's dilemma analysis should not be overstated. The presence of a prisoner's dilemma is neither a necessary nor a sufficient basis for copyright protection.

It is not a *sufficient* basis for protection because other normative concerns, such as free speech, could counsel against granting rights over copying even where a prisoner's dilemma is present.⁴⁶ The prisoner's dilemma model captures only the welfare of the two participant players, while in real copyright cases the public interest is affected in ways not fully reflected in the revenues earned by creators and copyists.

Further, there is experimentation and theoretical work on prisoner's dilemma that suggests that its payoff pattern may not create as strong disincentives to cooperation as has been thought; for example, personality may make a difference in persons' response to the game's payoff structure, and repeated "plays" of the game may yield cooperation—not defection—even in the absence of legal constraints altering the payoff structures.⁴⁷ The latter finding is particularly important because copyist/creator confrontations may be iterated over time. Also,

45. See text following note 29, *supra*, for the full set of matrix conditions.

46. See, e.g., Wendy J. Gordon, *Toward a Jurisprudence of Benefits*, 57 U. CHI. L. REV. 1009, 1032-49 (1990) (examining the problem of copyright being used as a mode of private censorship); Wendy J. Gordon, *Reality as Artifact: From Feist to Fair Use*, 55 J. LAW. & CONTEMP. PROBLEMS (forthcoming Spring 1992) (suggesting grounds for giving the public certain entitlements to use others' creation as facts).

47. See, e.g., DAVIS, *supra* note 2, at 130 (personality variables); FRIEDMAN, *supra* note 2, at 69-70 ("the repeated prisoner's dilemma").

some individuals may be better "players" than others, making it harder to argue that all affected parties would consent to a change in the payoff structure. Thus, identifying the prisoner's dilemma game underlying the traditional incentive argument for intellectual property protection serves not to make a rock-hard case for protection, but rather leads us to an additional source of insights: research by game theorists—and critiques thereof—that may provide useful avenues for re-examining the power and applicability of the traditional argument.

As prisoner's dilemma is not a sufficient basis for legal protection, it is also not a necessary prerequisite for such protection. First, other forms of market failure or need for incentives may exist⁴⁸ that can satisfy the first prong of the asymmetric market failure test. Second, asymmetric market failure itself addresses only the economic basis for copyright, and there may be noneconomic reasons for intellectual property protection that could persuade policymakers.

IV. CONCLUSION

The presence of a prisoner's dilemma or other market failure suggests there may be an economic need for intellectual property protection. Such legal protection will only accomplish its economic goals if, in response to the law, markets evolve, and copyright owners sell and license their works to those members of the public who wish to use them. I have advanced the notion of asymmetric market failure to capture these two essential prongs of the economic argument for intellectual property law. Where asymmetric market failure is present, an intellectual property regime is most likely to be worthwhile, in terms of its allocative gains outweighing its transaction costs.

There are five facets to the allocative and transaction cost argument that deserve to be briefly summarized:

(1) Markets tend to be better institutions for making prices than courts. Decentralized markets are more flexible and accurate than courts⁴⁹ and arguably involve less coercion than courts can impose. Perhaps most importantly, persons bargaining in markets arrive at prices through a less expensive mechanism than do litigants suing in courts. The same arguments apply, though probably to a lesser degree, when one compares markets with governmental administrative agencies.

(2) Markets are therefore desirable. A legal rule that produces incentives only through continual judicial or administrative-agency intervention is less desirable than a legal rule that need be applied only

48. See generally Kitch, *supra* note 13.

49. See, e.g., Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089 (1972).

occasionally because it is effective in encouraging voluntary markets to form.

(3) Markets in which copyists pay creators will evolve only if copyists have a reason to pay. This reason can be physical as when the creator erects an opaque fence around the work or scrambles his television transmission;⁵⁰ it can be based on the common law, as when a composer/musician uses the trespass law to extract money from people who want to enter her land to record her playing her music; or it can be based on explicit intellectual-product law, as when the creator has rights to prohibit copying.

(4) It is expensive to grant new legal rights. It should be done only when common-law rights, physical fences and the like are inadequate means of providing the necessary incentives. If it is desirable to give creators incentives, this should happen only when the creators lack leverage otherwise to obtain license fees.

(5) The "public goods" feature of intellectual products⁵¹ means that it is difficult to exclude free riders; free rides are easy to take because copying is cheap. Often, fencing will not be adequate. If creation is expensive, if access is often easy and copying is usually cheap, and if there are competing creators and copyists, this combination of features is likely to lead to a prisoner's dilemma situation in which legal rights may be required to encourage productive behavior.

In conclusion, legislatures and courts pursuing economic goals should give intellectual property rights only where creators *without rights over copying* face market failure because, e.g., they are unable to fence off the goods from nonpayors; only in those situations is there a need for legal intervention. Prisoner's dilemmas do not arise when goods are fenced. Legislators and courts also should hesitate to give rights over copying unless it is clear that users *bound by duties to refrain from copying* can obtain market deals. Only if copyists do not face market failure are they in a position to respond to a legal rule that tells them they must pay. If they can indeed respond to a "do not copy" rule adopted by a legislature or court, the likely result will be an ongoing, self-generating market that needs only occasional judicial enforcement to keep it functioning. Where one observes this asymmetry—the likelihood that there will be a market failure if there are no rights over copying, and the likelihood that there will be no market failure if such rights are introduced—that is some indication that granting legal rights over copying will be economically desirable.

50. On the many types of fencing that can exist, see generally Breyer, *supra* note 12 and Palmer, *supra* note 12.

51. See *supra* note 8 and accompanying text.