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Contact author at lfennell@mail.law.utexas.edu

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## The Commons and the Cathedral

Lee Fennell\*

The commons<sup>1</sup> presents weighty problems of far-reaching significance,<sup>2</sup> as the large and growing literature in this area attests.<sup>3</sup> While problems presented by common pool resources and common property are often resolved or avoided through nonlegal means,<sup>4</sup> legal entitlements constitute an important set of options for structuring responses to commons dilemmas. Moreover, entitlements (whether *de jure* or *de facto*) are always involved in setting the background conditions against which commons interactions play out,<sup>5</sup> and are always at least implicitly responsible for contributing to the conditions that generate commons tragedies.<sup>6</sup> The

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\* Assistant Professor, University of Texas School of Law.

<sup>1</sup> The term "commons" is not always given a consistent meaning. See, e.g., Charlotte Hess & Elinor Ostrom, *Ideas, Artifacts, and Facilities: Information as a Common-Pool Resource*, 66 LAW & CONTEMP. PROBS. 111, 114-28 (2003) (discussing differing uses of the term "the commons" and detailing some sources of confusion). Here, I will use it to reference a limited-access commons with a finite number of members, not an open-access regime. See, e.g., Robert C. Ellickson, *Property in Land*, 102 YALE L.J. 1315, 1322 (1993) (distinguishing an open access regime from ownership by a close-knit group or a larger "horde").

<sup>2</sup> See, e.g., ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION 3 (1990) (observing that "[m]uch of the world is dependent on resources that are subject to the possibility of a tragedy of the commons").

<sup>3</sup> A crucial catalyst to work in this field was Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243 (1968). Recent collections on the commons include, e.g., THE COMMONS IN THE NEW MILLENNIUM: CHALLENGES AND ADAPTATIONS (Nives Dolšak & Elinor Ostrom, eds., 2003); THE DRAMA OF THE COMMONS (Elinor Ostrom et al. eds., 2002); MANAGING THE COMMONS (John A. Baden & Douglas S. Noonan, eds., 2d ed. 1998).

<sup>4</sup> See, e.g., OSTROM, *supra* note 2.

<sup>5</sup> See, e.g., YORAM BARZEL, ECONOMIC ANALYSIS OF PROPERTY RIGHTS 85 (1997) (explaining that life cannot go on without an implied right to what one consumes, making it impossible "to discover any evidence of a pre-property rights state, since it is not possible to endow a pre-property rights state of affairs with meaning"); Edella Schlager & Elinor Ostrom, *Property-Rights Regimes and Coastal Fisheries: An Empirical Analysis*, in THE POLITICAL ECONOMY OF CUSTOMS AND CULTURE: INFORMAL SOLUTIONS TO THE COMMONS PROBLEM 13, 19-21 (Terry L. Anderson and Randy T. Simmons, eds. 1993) (discussing *de jure* and *de facto* rights to common property).

<sup>6</sup> A moment's reflection establishes that Hardin's overgrazing example only works if the rancher "owns" the meat that results from grazing cattle on the common land; that is, if we have some

categorization of entitlements into those protected, respectively, by property rules and liability rules has yielded an intricate body of legal scholarship of great relevance for the engineering of solutions to conflicting property interests.<sup>7</sup> Curiously, however, legal scholars have done relatively little to apply this important body of sophisticated scholarship to the commons setting. Instead, those studying options for protecting entitlements typically use stylized examples featuring a “polluter” (usually a factory) and a “victim” (usually a laundry or homeowner).<sup>8</sup> Unique features of the commons situation, such as the fact that members of a commons are potential polluters and potential victims at the same time, alter the analysis in important ways and open up untapped opportunities for devising innovative solutions to commons problems.

The paper is divided into three parts. In Part I, I provide an overview of the existing literature on entitlements, discuss how commons situations differ from the standard polluter/victim interaction, and show how the six “rules” that have been identified for protecting entitlements would translate into a simple commons situation involving a residential neighborhood. In Part II, I discuss the signature difficulties associated with these various solutions. Each of these difficulties is fundamentally rooted in heterogeneity in the subjective valuation of entitlements. Property rule solutions cater to heterogeneous subjective valuations by giving each entitlement-holder an absolute veto power over transfers, but this structural solicitude to valuation differences also provides a strategic opportunity for “holding out” -- that is, pretending to have a different valuation than one actually has, in an effort to capture more of the surplus associated with transfer. Liability rule solutions (and their mirror image, “put options”) avoid this latter problem by allowing unilateral transfers on the initiative of just one party. However, this means potentially overriding true subjective valuations to effectuate transfers that are not, in fact, efficient. In Part III, I discuss ways to adapt or mix these mechanisms to better manage these twin risks in the commons setting, and further consider the

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coherent idea of what is meant by “his cattle” that affords him the benefit of the product of the animal and the grass that it eats.

<sup>7</sup> The article that launched this field of study is Guido Calabresi & Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089 (1972). The vast literature analyzing and building upon Calabresi & Melamed’s taxonomy includes, e.g., Ian Ayres & Paul M. Goldbart, *Optimal Delegation and Decoupling in the Design of Liability Rules*, 100 MICH. L. REV. 1 (2001); Symposium, *Property Rules, Liability Rules, and Inalienability: Twenty-Five Year Retrospective*, 106 YALE L.J. 2083 (1997); Louis Kaplow & Steven Shavell, *Property Rules Versus Liability Rules: An Economic Analysis*, 109 HARV. L. REV. 713 (1996); Ian Ayres & Eric Talley, *Solomonic Bargaining: Dividing a Legal Entitlement to Facilitate Coasean Trade*, 104 YALE L.J. 1027 (1995); James Krier & Stewart J. Schwab, *Property Rules and Liability Rules: The Cathedral in a Different Light*, 70 N.Y.U. L. REV. 440 (1995); A. Mitchell Polinsky, *Controlling Externalities and Protecting Entitlements: Property Right, Liability Rule, and Tax-Subsidy Approaches*, 8 J. LEGAL STUD. 1 (1979).

<sup>8</sup> There are some exceptions to this two-party focus. See, e.g., Calabresi & Melamed, *supra* note 7, at 1106-07 (presenting the example of Guidacres, land owned in parcels by 1,000 individuals which would be more efficiently turned into a park for the use of 100,000 citizens in a neighboring town). While such examples capture some of the strategic interactions uniquely or more strongly present in the large number setting, they do not present a commons-type situation in which the buyers and sellers in question are significantly overlapping or coterminous.

impact that the choice of legal entitlements may have on nonlegal mechanisms such as norms for controlling the commons..

## I. Bringing the Cathedral into the Commons

Guido Calabresi and Douglas Melamed ushered in a new way of thinking about legal entitlements with their groundbreaking 1972 article, *Property Rules, Liability Rules, and Inalienability Rules: One View of the Cathedral*.<sup>9</sup> The schema that they introduced can be conjured up in the minds of many legal scholars via the shorthand term “the cathedral.” Calabresi and Melamed divide up the world of legal entitlements into categories, based on the circumstances under which they can be transferred. An entitlement protected by a property rule can only be transferred by the consent of both the buyer and the seller (the owner of the entitlement) at a price on which buyer and seller mutually agree.<sup>10</sup> In other words, the seller can stand on her rights and refuse to sell unless and until she receives an offer for her entitlement that she chooses to accept. An entitlement protected by a liability rule, in contrast, can be transferred against the will of the current entitlement-holder on the unilateral initiative of a buyer, at a price that is objectively determined (e.g., by a court or a regulatory body).<sup>11</sup> A given entitlement can be protected in one way under some circumstances, and another way under different circumstances. For example, an individual’s entitlement to her home is usually protected by a property rule, but is only protected by a liability rule against the government when the government is acting pursuant to its power of eminent domain.<sup>12</sup>

Calabresi and Melamed analyzed four rules that might be used to resolve a dispute between a polluter and a victim.<sup>13</sup> The four rules arise from the combination of two binary choices: which party holds the entitlement, and whether the entitlement is protected by a property rule or a liability rule.<sup>14</sup> A rich and complex literature has sprung up since the

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<sup>9</sup> Calabresi & Melamed, *supra* note 7.

<sup>10</sup> *Id.* at 1092, 1105. Sometimes an interest protected by a property rule can literally be transferred against the owner’s will, as in the case of theft, but the legal response in such cases is elevated beyond simply making the transgressor pay for the damage done, to reflect the desire to deter such conduct. *See id.* at 1126 (discussing an “undefinable kicker” societally added to involuntary transfers undertaken in violation of the criminal law, in furtherance of the goal of deterring such transfers).

<sup>11</sup> *See id.* at 1105-06 (discussing use of an “external, objective standard of value” to accomplish the transfer in question). A third category of protection, not of direct relevance here, is inalienability -- entitlements that *cannot* be transferred. *See id.* at 1111-15 (discussing possible rationales for inalienability rules).

<sup>12</sup> *See id.* at 1093. (giving this example).

<sup>13</sup> Three of these rules had been previously identified and analyzed in Frank I. Michelman, *Pollution as a Tort: A Non-Accidental Perspective on Calabresi’s Costs*, 80 YALE L.J. 647 (1971); *see* Calabresi & Melamed, *supra* note 7 at 1115 & n.53 (noting Michelman’s contributions).

<sup>14</sup> Calabresi & Melamed, *supra* note 7, at 1115-24. The four possibilities discussed by Calabresi & Melamed, as played out between the stock characters of a factory and a homeowner, are as follows: A homeowner might hold the entitlement to the air, protected by a property rule, and be able to enjoin the factory from polluting (Rule 1). Alternatively, the homeowner might hold the

publication of *The Cathedral* that applies and extends the Calabresi and Melamed template.<sup>15</sup> Scholars have engaged in elaborate debates about the conditions under which property rule protection is superior to liability rule protection, and vice versa,<sup>16</sup> and have even identified two new rules representing “put” options.<sup>17</sup> In recent work on this topic, scholars have suggested using combinations of rules to better harness private information about valuations.<sup>18</sup>

### A. An Uncommon Literature

For purposes of expositional clarity, work on entitlements has typically employed simple models involving parties that represent separate polluters and victims (typically a factory spewing fumes, and a nearby laundry or homeowner that is harmed). As a result, the implications of the choice between property rules and liability rules *in a commons* have not been spelled out in a systematic fashion. This shortfall is significant, because some of the features that are uniquely present in the context of a limited-access common pool resource require a rethinking of the choice between property rules and liability rules.

One major difference is that each member of a group sharing a common pool resource is simultaneously a potential injurer and a potential victim, and, likewise, simultaneously a potential uncompensated benefactor (“sucker”) and a potential free-rider. While Coase emphasized that problems of conflicting land use are always “reciprocal” in the sense that no injury happens unless the injured party is there to be injured,<sup>19</sup> the type of reciprocity associated with a group’s access to a common pool resource is fundamentally different. In one sense, the problem should be an easier one to solve, for everyone stands in at least roughly the same position as everyone else.<sup>20</sup> Any rule that is enacted to manage the common resource will

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entitlement to the air protected only by a liability rule, such that the factory could obtain the right to pollute at a given price (Rule 2). Third, the factory might hold the entitlement to the air, protected by a property rule, such that it held the right to pollute at will (Rule 3). Fourth, the factory might hold the entitlement to the air, protected only by a liability rule, such that the homeowner could obtain rights over the air by paying the factory a particular price to stop polluting (or move away) (Rule 4).

<sup>15</sup> See *supra* note 7.

<sup>16</sup> In a world of no transactions costs, property rules would suffice to deliver efficient outcomes. Even if the “wrong” party started out with the entitlement, a costless transaction would move it to the party who valued it most highly. See Ronald H. Coase, *The Problem of Social Cost*, 3 J. L. & ECON. 1 (1960). Unsurprisingly, then, transactions costs feature prominently in discussions about the circumstances under which liability rules are appropriate. However, even when transactions costs are high, the costs of determining an appropriate damage amount may loom still higher. For an overview of the literature on this point, see Michael I. Krauss, *Property Rules v. Liability Rules* in ENCYCLOPEDIA OF LAW & ECONOMICS, 782, 788-89 (Boudewijn Bouckaert & Gerrit De Geest, eds.), available at <http://encyclo.findlaw.com/index.html>.

<sup>17</sup> See notes accompanying Figure 1, *infra*.

<sup>18</sup> See Ayres & Goldbart, *supra* note 7; Ronen Avraham, *Modular Liability Rules*, University of Michigan, John M. Olin Center for Law & Economics, Paper #01-003 (2001), available at [http://www.ssrn.com/abstract\\_id=272816](http://www.ssrn.com/abstract_id=272816).

<sup>19</sup> Coase, *supra* note 16.

<sup>20</sup> Complications introduced by intragroup heterogeneity will be discussed presently.

restrain the same people it benefits, and benefit the same people it restrains. This fact has two implications, one practical, and one epistemological. First, resistance to the idea of a control is likely to be much lower, because there is a built-in form of compensation -- an "average reciprocity of advantage."<sup>21</sup> Second, the fact that each group member must balance the desire to restrain others against the costs of being restrained herself might be expected to yield more honest statements of subjective preferences about the desirability of restraint. To the extent this is true, it greatly reduces the costs of obtaining private information about the value of a given entitlement.

In addition, the idea of a limited access commons itself presupposes some earlier phase in which a group came to share the commons. How did this come about? It could have been through the operation of law, as where several descendants become tenants in common upon inheriting a piece of land, or it could have arisen as the result of fully or partially voluntary decisions on the part of the group members. Where the former is the case, kinship ties may exist providing a certain commonality of interest. Where the latter is the case, greater intragroup homogeneity can be achieved through intentional sorting designed to bring about that result. Intentional selection and sorting perhaps reaches its apogee in the modern co-op in New York, where intensive scrutiny of the financial records of would-be members is routine. Unlike the standard factory and laundry story, where it is unlikely that *both* parties elected to locate near each other, there is room in the story of common pool resources for universally voluntary actions that reduce the degree of preference variance within the community.<sup>22</sup>

Likewise, members of a commons are likely to be involved in repeated dealings with each other on multiple fronts. Even in the simple case of a communal fish pond, the group members will have at least two collective action problems to interact over -- how to manage the resource itself, and how to enforce the choice about how to manage it. The resource-gathering environment is a commons of its own, where all can gain from investments in friendly and orderly resource harvesting. This makes feasible the creation of centralized mechanisms for transferring and enforcing entitlements. The potential role of sorting, the multiplex interactions that the group members may have with each other, and other factors tending towards homogeneity and reciprocity within the group all combine to give norms a larger role than is usually suspected in the factory and laundry tale. That norms can resolve common interest dilemmas independent of (or in ignorance of) legal entitlements is no news.<sup>23</sup> What is noteworthy and not yet adequately explored is the possibility that the shape of entitlements can themselves influence the development and deployment of social norms in a commons.

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<sup>21</sup> See Richard Epstein, *A Clear View of The Cathedral: The Dominance of Property Rules*, 106 YALE L.J. 2091, 2103 (1997) (discussing possibility of reciprocal in-kind compensation in which each party must bear "small slights" but may also undertake activities themselves that may inflict similar amounts of damage on others); cf. *Pennsylvania Coal Co. v. Mahon*, 260 U.S. 393, 415 (1922) (suggesting relevance of "average reciprocity of advantage" to regulatory takings question).

<sup>22</sup> The sorting that brings this result may have unfortunate consequences for the larger world in which the commons exists, and this is a matter of serious concern. Indeed, the larger world is a commons in its own right and its human capital can be understood as a resource over which there will be struggles that may turn tragic.

<sup>23</sup> See, e.g., OSTROM, *supra* note 2; ROBERT C. ELLICKSON, *ORDER WITHOUT LAW* (1991).

On the other hand, the relatively large numbers of people that are likely to share a common pool resource leads us into an area of high transactions costs. While transactions costs can be quite high in the case of bilateral monopoly involving only two players, in a commons we must worry not only about transactions costs stemming from strategic behavior, but also about transactions costs of the nonstrategic, mundane variety associated with simply communicating and coordinating.<sup>24</sup> This may thwart the search for solutions even before strategic behavior comes into play. Nevertheless, a stable group using a given commons will likely find it worthwhile to put into place mechanisms to ease communication among them.

In subpart B, I will lay out the menu of entitlement allocation and protection options, as applied to a ubiquitous commons – the residential neighborhood.<sup>25</sup>

## **B. A Menu of Options in a Neighborhood Commons**

Neighbors share overlapping environments, and also have the power to undertake actions that will contribute to, or detract from, those overlapping environments. A high degree of aesthetic or experiential interdependence results. To take a prosaic example, when one homeowner paints her front door puce, other neighbors share in the environment to which this action contributes. Whatever environment eventuates from the sum of neighborly actions (when coupled with preexisting property rights and natural features) is a public good (or public bad) in the economic sense, having the features of both nonrival consumption and nonexcludability.<sup>26</sup> Each person's consumption of the environment does not diminish anyone else's consumption of that same environment, nor can any neighbor be excluded from the environment (nor escape from it, so long as she remains in the neighborhood).

Common pool resources differ from public goods in that they feature subtractibility -- when one person takes a fish from a common pool, this diminishes the number of fish left for other people.<sup>27</sup> In contrast, when one neighbor experiences the neighborhood environment, this does not reduce the amount left for anyone else to experience. However, neighbors can engage in behaviors that have the effect of reducing or augmenting neighborhood quality. These might be understood as “draws” taken from, or “contributions” made to, a common pool resource, which I will here term “neighborhood ambience.” Loud parties, disabled vehicles, and overgrown yards

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<sup>24</sup> Communicating can itself become a tragedy of the commons, as we see in the context of e-mail spam. While e-mail and other internet innovations make it easy for large numbers of people to communicate instantly with each other and to meet in virtual space to make decisions, costless communications media also spawn overuse.

<sup>25</sup> A neighborhood is, in an important sense, a “commons within a commons” insofar as its formation may involve strategic interactions. I have explored elsewhere some of the issues that are presented when the formation of a group, as well as its internal actions, are the product of strategic interactions; *see generally* Lee Anne Fennell, *Beyond Exit and Voice: User Participation in the Production of Local Public Goods*, 80 TEX. L REV 1 (2001), but will confine my analysis here to just the internal workings of the neighborhood.

<sup>26</sup> *See, e.g.*, RICHARD CORNES & TODD SANDLER, *THE THEORY OF EXTERNALITIES, PUBLIC GOODS, AND CLUB GOODS* 6-7 (1986).

<sup>27</sup> *See, e.g.*, Elinor Ostrom, *Private and Common Property Rights* (1999), in *ENCYCLOPEDIA OF LAW AND ECONOMICS* 332, 337-38 (Boudewijn Bouckaert & Gerrit De Geest, eds.), *available at* <http://encyclo.findlaw.com/index.html> (discussing this distinction).

usually represent draws against neighborhood ambience in that they typically generate negative externalities. Flower gardens, attractive fences, and well-kept houses usually represent contributions that generate positive externalities.<sup>28</sup> Local ambience in a neighborhood setting can thus be understood as a commons that people will be tempted to both “overgraze” (by making socially harmful choices that generate negative externalities) and “undercultivate” (by failing to make socially beneficial choices that would generate positive externalities). Externalities, both positive and negative, manifest themselves in the neighbors’ enjoyment of the residential experience and (often more importantly) in changes in the values of the properties within the neighborhood.<sup>29</sup>

Nuisance law, zoning, private covenants, and social norms all represent possible ways of addressing tendencies to make suboptimal draws against, and contributions to, neighborhood ambience. Indeed, most neighborhoods feature at least three of these sources of restraint operating at some level. To put this in terms of entitlements, landowners hold rights over certain uses of their own land, typically those with no or mild spillovers, while the community (either as a body, or severally through its members) holds the balance of the rights over the landowners’ use of the land.<sup>30</sup> Although private developments governed by restrictive covenants and areas zoned for historical preservation represent a growing class of exceptions, in most places the homeowner retains control over a significant set of draws from, and contributions to, neighborhood ambience.

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<sup>28</sup> It is true that, depending on what one is looking for in a neighborhood, some of the things I have identified as contributions might instead be perceived as draws, and vice versa. The possibility of heterogeneous tastes and disputes about the sign (positive or negative) associated with externalities generated by particular activities introduces difficulties that are very important, although not unique to the realm of aesthetics and neighborly sensibilities. Consider, for example, the wolf, whose destruction was once viewed as generating a positive externality, but whose preservation is now viewed as generating a positive externality. Beliefs about the value of (and implicitly about the externalities generated by) many other land and resource use arrangements have also changed over time. See Robert Bruegmann, *Urban Density and Sprawl: An Historical Perspective*, in *SMARTER GROWTH: MARKET-BASED STRATEGIES FOR LAND-USE PLANNING IN THE 21ST CENTURY* 155, 177 (Randall G. Holcombe & Samuel R. Staley, eds. 2001) (discussing past preference reversals regarding matters such as power generation, public housing, urban renewal, and zoning).

<sup>29</sup> See Lee Anne Fennell, *Homes Rule*, 112 *YALE L.J.* 617, 646 & n.121 (2002) (book review) (explaining that a homeowner attempts to maximize the present value sum of the consumption stream she enjoys in a particular home and the resale value of the home -- both of which are influenced by the surrounding community).

<sup>30</sup> Control over uses of the land can be divided between the individual landowner and the community of which the landowner is a member in any number of ways. See, e.g., WILLIAM A. FISCHER, *REGULATORY TAKINGS* 343 fig. 9.1 (1995) (presenting a “restriction index” that graphically represents the possible divisions of entitlements). For example, zoning and nuisance law might grant the community control over uses that are unusually intensive for a given time and place, while leaving to the individual control over land uses that are considered “normal” for that time and place. See FISCHER, *supra*, at 351-55 & fig. 9.2 (dividing up spectrum of possible land uses into categories labeled “subnormal,” “normal,” and “supernormal”).

For example, in most neighborhoods in the United States, people are free to put objects of their own choosing, such as plastic flamingos or concrete gnomes, in their front yards. Neighbors may suffer negative spillovers as a result of this conduct. Because people do not internalize the full cost associated with yard art, but do internalize the full benefit, they are likely to do too much of it from an allocative efficiency standpoint. In other words, they will be tempted to “overgraze” the visual or aesthetic field. However, it is also possible that some people enjoy putting art in their yards to such a great degree that the benefits they enjoy as a result swamp the costs, including those imposed on other members of the community.<sup>31</sup> There are a number of possible legal responses to this sort of land use conflict.

Figure 1: Neighborhood Ambience: A Menu of Choices

Rule	Entitlement Held By	How Protected?	Examples
1	Community	Property Rule	flamingos are forbidden; landscaping is required
2	Community	Liability Rule (Individual Holds Call Option)	flamingos are taxed; failure to landscape is taxed
3	Individual	Property Rule	flamingos are welcome; landscaping is optional
4	Individual	Liability Rule (Community Holds Call Option)	the community can remove the flamingo by paying the individual a removal fee; the community can require landscaping by paying the individual a landscaping fee
5	Individual	Put Option	individual can keep the flamingo <i>or</i> get rid of it and collect a removal fee; individual can go without landscaping, <i>or</i> landscape and collect a fee
6	Community	Put Option	community can demand the flamingo’s removal <i>or</i> collect a flamingo tax; community can demand landscaping <i>or</i> collect a tax for failure to landscape

Figure 1 uses the schema developed by Calabresi and Melamed and their successors to lay out a menu of options for addressing matters of neighborhood ambience.<sup>32</sup> I use two

<sup>31</sup> This is merely a recognition of the fact that the presence of impacts on other parties does not necessarily indicate the presence of inefficiency. It is possible that even if the externalized costs were fully taken into account, behavior would not change. If this is the case, then the impacts on other parties may be distributionally unfair, but not inefficient. See JESSE DUKEMINIER & JAMES E. KRIER, PROPERTY 51-52 (5th ed. 2002).

<sup>32</sup> This table is adapted from ones generated by other authors. See, e.g., Avraham, *supra* note 18, at 8 tbl. 1; Ayres & Goldbart, *supra* note 7, at 6 fig. 2. The first four rules are those discussed by Calabresi and Melamed; the last two were added by later scholars. See Avraham, *supra*, at 7 & nn.10-11 (describing history of rules 5 and 6 and providing citations to work developing them).



examples throughout the chart to show the practical implications of each rule in this context: one involves an activity -- putting a plastic flamingo in the yard -- often thought to generate negative externalities; the other involves an activity -- landscaping -- generally believed to generate positive externalities. The word “flamingo” in each example could be replaced by anything that generates negative spillovers within a commons, and the word “landscaping” could be replaced by anything that generates positive spillovers within a commons.

Of course, it is not necessary that the entitlements be allocated and protected in the same way where negative spillovers are at stake as they are when positive spillovers are at stake; indeed, it is quite likely that there will be different entitlement allocations and protections involved even *within* the categories of negative externality-generating actions and positive externality-generating actions. The purpose of pairing these examples is not to suggest that they would necessarily be linked together in reality, but rather to show how the rule in question works in the context of the two sorts of impacts.

The allocation of rights between the individual and community as shown in the table basically tracks the two-person model traditionally developed in the literature; it therefore suppresses some additional complications associated with the meaning of the community, its capacity to properly aggregate and act on preferences, and the import of its membership being composed of individuals within it. These complications will be taken up in Part II, as I work through the options in detail.

## II. Heterogeneous Groups and the Choice of Entitlements

In the basic stylized account of the tragedy of the commons, heterogeneity does not feature prominently. Instead, we see a group of essentially interchangeable individuals all driven by self-interest to do the same socially costly things -- littering, overgrazing, shirking, overfishing, and so on. The role of heterogeneity among group members has been given increasing attention in the literature.<sup>33</sup> For example, differences or similarities in culture, wealth, or norms may influence the ease with which a group can escape a dilemma. Likewise, people who are differently situated with regard to either the benefits they receive from using a resource or the costs they suffer from the resource use of others will have different amounts to gain or lose from solving a dilemma. This latter sort of heterogeneity becomes critically important in choosing among possible entitlement allocations and protections, and will be the primary focus here. However, it is helpful to keep in mind the other sorts of heterogeneity that may cause people to act in ways that diverge from a narrow form of rational self-interest.

Heterogeneity in subjective valuations turns out to be very important in deciding how entitlements can best address potential commons problems. It generates one set of potential

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In some scholarly discussions of these rules, numbers 5 and 6 are reversed. See Ayres & Goldbart, *supra* note 7, at 7 n.13.

<sup>33</sup> See, e.g., Pranab Bardhan & Jeff Dayton-Johnson, *Unequal Irrigators: Heterogeneity and Commons Management in Large-Scale Multivariate Research*, in *THE DRAMA OF THE COMMONS* 87 (Elinor Ostrom et al., eds, 2002) (surveying a number of kinds of heterogeneity in empirical studies, including cultural, social, and wealth heterogeneities, and reviewing literature on heterogeneity in commons management);

problems where entitlements are protected by property rules, and another set of problems where entitlements are protected by liability rules (“call options”) or “put options.” I will consider these in turn in subparts A and B, below. First, however, it is helpful to lay out a simple example that captures the types of heterogeneity with which I will here be concerned.

To begin, imagine that we have a community made up of people who potentially split into three different camps on two different dimensions, as shown in Figure 2.<sup>34</sup> For consistency with our earlier illustration, I am looking at the preferences of community members with regard to entitlements to place flamingos. However, the example could as easily involve any other externality-producing activity that inspires varied subjective responses.

Figure 2: A Heterogeneous Community’s Flamingo Preferences

Net Benefit of Own: Net Cost of Others’:	None	Low	High
None	I. No Benefit, No Cost	II. Low Benefit, No Cost	III. High Benefit, No Cost
Low	IV. No Benefit, Low Cost	V. Low Benefit, Low Cost	VI. High Benefit, Low Cost
High	VII. No Benefit High Cost	VIII. Low Benefit, High Cost	IX. High Benefit, High Cost

One dimension on which people vary is in their private subjective valuations of their own entitlements -- here, the entitlement to place flamingos. The three columns represent three possible valuations of the flamingo entitlement. In the leftmost column, the individual gains no net benefits from flamingo placement. In the middle column, the individual enjoys benefits of personal flamingo placement that exceed his *internalized share* of the costs associated with that placement, but derives less benefit from personal flamingo placement than it costs the community as a whole. The rightmost column represents people who value their own flamingo placement to an extent that exceeds the costs it imposes on the whole community. In other words, the flamingo placement carried on by people in the middle column is inefficient, while

<sup>34</sup> As I will explain, some of the resulting combinations are mutually exclusive.

the flamingo placement undertaken by those in the right column is efficient. The people in the left column have no a priori reason to place flamingos at all since they derive no benefit from this activity, although they might do so strategically under some imaginable entitlement regimes.

The second dimension on which people vary is the degree to which they are harmed by other people's exercise of entitlements (or the degree to which they would value having an entitlement to prevent that exercise). Here, the top row represents people who are not bothered at all by the flamingo placement of others, the middle row represents people who are bothered somewhat by the flamingo placement of others, but not enough to do anything about it on their own, and the bottom row represents people for whom flamingo placement by others is so costly that they would be willing and able to pay the full amount it would cost to buy up everyone else's flamingo placement rights.<sup>35</sup>

If we begin in a Rule 3 world, in which individuals hold the right to do as they please with regard to flamingos, we have the potential for a tragedy of the commons. Whether or not the makings of tragedy exist depends on how the population maps onto the preference chart. For example, nobody in the top row (Cells I, II, and III) suffers any harm from the flamingos of others. If everyone in a given community had preferences corresponding to one of these three cells, then there would be nothing tragic about the proliferation of flamingos that resulted (assuming the community is self-contained, and that there are no spillovers on outsiders, or on nonhuman organisms within the community). Similarly, nobody in the lefthand column (Cells I, IV, and VII) has any desire to place flamingos out in their yards. If everyone in a given community had preferences corresponding to one of these cells, then there would be no flamingos, and no tragedy either. The standard tragedy of the commons story usually features people who have the preferences depicted in Cell V. Cell V people will put out more flamingos than is efficient, but they also suffer from the flamingo placement of others. They are locked in a Prisoner's Dilemma in which their best strategy is to "defect" by putting out flamingos of their own, no matter what everyone else does.

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<sup>35</sup> Not all of the cells shown in Figure 2 can be occupied simultaneously. As a matter of logic, only one individual (at most) can occupy Cell IX. This is someone who both so highly regards her own flamingo rights that she would be willing to pay everyone else a sufficient amount to compensate them for the costs they incur, but so detests everyone else's flamingos that she would also be willing to pay everyone in the community their reservation price for their flamingo rights. This could only be true of one person; if two people loved their own flamingos but hated everyone else's, one of the two would be able to outbid the other. Likewise, if someone does occupy Cell IX, then nobody can occupy Cells III or VI, because nobody would then enjoy a benefit so great that they could compensate everyone else for their harm. Specifically, nobody would be able to compensate the person in Cell IX, who by definition is harmed by the flamingos of others so much that she would be willing to pay the reservation prices of everyone else. By the same token, the existence of a person in Cell IX rules out the possibility of anyone in Cells VII or VIII, because nobody would be able to buy out the person in Cell IX, who by definition benefits so much that she can pay everyone else for the privilege. Similar logic dictates that if at least one person is in Cells III and/or VI, then Cells VII, VIII, and IX must be empty. If one or more persons are in Cells VII and/or VIII, then Cells II, VI, and IX must be empty.

If we assume a core of Cell V people, then the stage is set for tragedy, unless some action is taken. If some threshold organizational hurdles could be cleared, the group might get together to address this problem through changes in entitlements. Let us consider some of their options.

#### A. Property Rules and Hold Outs

The regime that I have just described already involves a property rule entitlement held by the individuals in the community to do as they please with flamingos (Rule 3), and the potential for inefficient results associated with that rule should already be evident. One option is to simply ban flamingos -- that is, move from a Rule 3 regime to a Rule 1 regime, in which the community holds the flamingo rights and can prevent anyone from placing flamingos. Because enforcement will be necessary and costly, let us assume that the group holds a vote at the same time regarding hiring a flamingo control person whose job it is to remove (by force, if necessary) any flamingos found within the community.

The problem is heterogeneity. When the community gets together to take the vote, some people are likely to resist this two-part proposal. This might be because they occupy the top row (Cells I, II, or III), so that they feel no harm from flamingos and do not wish to contribute to enforcing the ban, or it might be because they occupy the rightmost column (Cells, III, VI, or IX) and derive more pleasure from flamingo placement than it costs the group as a whole. However, the resisters could actually be people who occupy Cells IV, V, VII, or VIII, who are hoping to either free-ride on the enforcement efforts of others by pretending indifference to flamingos, or hoping to capture a disproportionately large share of the surplus that will be generated by the vote by pretending that they will be severely harmed by the anti-flamingo rule and must be paid off in order to go along with it. Moreover, those in Cells IV and V are likely to argue that the people occupying cells VII and VIII (the virulent flamingo-haters) should have to pay more for enforcement, since they are getting more out of it, and were probably the ones who started the anti-flamingo campaign in the first place. Likewise, people in Cells V and VIII might argue that the people in Cells IV and VII should have to pay a larger share for the enforcement, since they are not being required to give up something they value -- personal flamingo placement.

Notwithstanding these squabbles, if the community's internal governance regime permits a vote to carry over the objections of the resisters, the no-flamingo rule with accompanying enforcement apparatus may indeed become the governing rule. This is all well and good (at least so far as efficiency goes) if the resisters really were from Cells, IV, V, VII, and VIII -- and were just acting strategically.<sup>36</sup> If they were instead high flamingo valuers (Cells III, VI, or IX) the ban will operate inefficiently as to them (because it will keep them from engaging in an activity that generates more benefits than harms, even when all of the externalized harms are counted). For example, consider Bella, who values flamingo placement at \$700, where the costs imposed on the entire community are only \$500. In a Coasean world free of transactions costs, she could of course buy her way out of the restriction. In the real world, however, things are more difficult. Bella could, for example, attempt to assemble permission from each and every neighbor in order to put out her flamingo in violation of the ban.<sup>37</sup> Given the surplus to be had,

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<sup>36</sup> There are distributive results that are arguably unfair, such as the fact that those most bothered by flamingos do not have to pay an extra premium for enforcement.

<sup>37</sup> If the ban were implemented through reciprocally binding covenants, then this would involve negotiating a release with each of her neighbors, and a single holdout neighbor could block the

everyone is better off if she is successful in accumulating permission to place the flamingo. Moreover, let us assume that the community has an excellent electronic billboard system to which every member is linked electronically in real-time, reducing nearly to zero the mundane costs of communicating and negotiating over entitlements. So far, the picture seems promising.

However, conflict over the division of the surplus is likely to thwart Bella's quest to collect the necessary permissions. Even if Bella is prepared to pay \$699 to the other community members (she is willing to "swerve" in advance in the game of Chicken<sup>38</sup> by gleaning only a \$1 surplus), the "community" is not a single person but rather an amalgamation of different interests. How should the remaining surplus be divided? An even division is unlikely to be satisfactory. Consider the case of Sneed. Not only does he find that the sight of flamingos interferes with his digestion, but his breakfast nook looks directly onto Bella's proposed flamingo placement site. Sneed is likely to have a reservation price that is quite high.<sup>39</sup> However, Bella would be willing to pay Sneed's true valuation, as well as the true valuations of the other community members, so highly does she value her flamingo rights. However, other members of the community, seeing the price that Sneed is asking in exchange for his grant of flamingo permission, will be inclined to ask for similar amounts. Further, given the nature of subjective valuations, it is impossible for anyone to tell whether a given neighbor really has the reservation price of a Sneed, or is just pretending to have such a price. The result may well be that Bella cannot gain the right to place her flamingo. Hence, in attempting to address a tragedy of the commons associated with "overgrazing" of neighborhood ambience, the community has created an aesthetic anticommons<sup>40</sup> into which even efficient incursions are impossible.

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deal and continue to obtain injunctive relief against the breach of the covenant (here, by keeping out the flamingo). See, e.g., *Rick v. West*, 288 N.Y.S.2d 195 (1962) (refusing to override the interests of a single covenant holder who refused to release her covenant restricting use of nearby land).

<sup>38</sup> Chicken takes its name from a dangerous driving game played by reckless teens: two cars drive toward each other, and the first driver to swerve is called a "chicken" and loses the game. However, this ignominious outcome is better for the loser than a head-on collision – the result if neither party swerves. See CHARLES J. GOETZ, *LAW AND ECONOMICS: CASES AND MATERIALS* 17 (1984). The same basic strategic structure applies to many negotiations where failure to achieve a deal is the worst outcome, but each party wishes to capture more of the surplus by forcing the other party to "swerve" by accepting a smaller surplus share.

<sup>39</sup> On the facts as I have given them, the total reservation price of all the community members is \$500, so the reservation prices even of the Sneeds in the group are included within that total.

<sup>40</sup> An anticommons situation is created where certain property rights (e.g., the right to exclude) are distributed to multiple parties without corresponding privileges (e.g., the right to enter). See Frank I. Michelman, *Ethics, Economics and the Law of Property* in *NOMOS XXIV: ETHICS, ECONOMICS AND THE LAW* 3, 6, 9 (1982) (describing an extreme regulatory regime in which rights without privileges are universally distributed); see also Robert C. Ellickson, *Property in Land*, 102 *YALE L.J.* 1315, 1322 n.22 (1993) (describing an anticommons as a space in which no person has an effective right to enter and use because every person holds a right to exclude, and attributing the roots of that idea to Michelman); Michael Heller, *The Tragedy of the Anticommons*, 111 *HARV. L. REV.* 621, 668 (1998) (defining anticommons property as "a property regime in which multiple owners hold effective rights of exclusion in a scarce resource"). An anticommons can yield tragic results that are the converse of those that

Can the community solve this problem by appointing a representative or body to deal with entitlement transactions, instead of leaving matters to be handled neighbor by neighbor? This is certainly possible, but one of two things will be true of any effort to solve the problem in this way. Either the representative or body will be empowered to make decisions on less than unanimous consent, in which case some interests will be overridden against individuals' wills, or the representative or body will be permitted to act only after gaining the unanimous consent of the group, in which case the problems already detailed will be likely to hamper transactions.<sup>41</sup>

The efficiency problem with the Rule 1 solution to the commons tragedy, then, is that it risks the creation of an anticommons tragedy -- precluding efficient draws against neighborhood ambience. To be sure, because Rule 1 gives each person in the community the right to set her own price for putting up with Bella's flamingo, it protects people with heterogeneous subjective valuations. But the protection that it provides for people with genuinely high valuations also provides protective cover for people without abnormally high valuations, who are merely interested in capturing a larger surplus from the sale. This presents the well-known difficulty of telling people with genuinely high valuations from those strategically holding out in the hopes of a better deal.

## B. Responding with "Calls" and "Puts"

A property rule granting the community the power to control what individuals do with their property is not the only way to address a potential tragedy of the commons. The community could try something else instead, such as a flamingo tax. Liability rules, also known as "call options," and their mirror image, "put options,"<sup>42</sup> facilitate transactions on one party's initiative and so avoid the kinds of hold out problems that can block efficient transfers under a property rule regime. Rather than ban a use altogether, as under a property rule, "calls" and

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associated with a commons. See, e.g., Heller, *supra* (expanding on the problem of the anticommons); James M. Buchanan & Yong J. Yoon, *Symmetric Tragedies: Commons and Anticommons*, 43 J. LAW & ECON. 1 (2000) (presenting a formal economic model of the anticommons). However, an anticommons need not inevitably produce inefficiencies. See Heller, *supra*, at 673-76, 675 (discussing nontragic anticommons, and suggesting that a developer's use of restrictive covenants "to convert raw land to anticommons form can be an efficiency-enhancing move." The possibility that common interest communities might present an anticommons problem was recognized in Michael Heller, *The Boundaries of Private Property*, 108 YALE L.J. 1163, 1185 (1999).

<sup>41</sup> See JAMES M. BUCHANAN & GORDON TULLOCK, *THE CALCULUS OF CONSENT: LOGICAL FOUNDATIONS OF CONSTITUTIONAL DEMOCRACY*, 3 THE COLLECTED WORKS OF JAMES M. BUCHANAN 65-73 (Liberty Fund 1999) (1962) (describing the tradeoffs between easier decisionmaking and protection of oneself from adverse decisions in choosing the level of consensus required for a decision).

<sup>42</sup> In fact, both calls and puts can be understood as different varieties of liability rules. See Ayres & Goldbart, *supra* note 7, at 6. However, the term "liability rule" has been traditionally associated with call options rather than puts.

“puts” help to appropriately “reprice” the use, taking into account external impacts.<sup>43</sup> I will describe these mechanisms briefly, and then return to the problem of heterogeneity, which recurs in somewhat different form here.

Entitlements vested in one party and protected by a liability rule (Rules 2 and 4) effectively grant the other party a “call option” to unilaterally buy the entitlement at a specified price.<sup>44</sup> A famous case law example of this is *Boomer v. Atlantic Cement Co.*<sup>45</sup>, where the court held that the cement plant could continue to pollute (that is, it could obtain the entitlement over the air) by paying “permanent damages” -- a court-determined amount -- to the parties injured by the pollution. A call option can work in the opposite direction as well; the polluter might be given the entitlement to continue polluting, but the victim might be given an option to buy up that pollution right at a specified price. A close case law analog is *Spur Industries v. Del E. Webb*, in which a developer who had constructed and sold residences uncomfortably close to a cattle feedlot was able to win an injunction against the continued operation of the feedlot, but at the price of covering the cost of its relocation.<sup>46</sup> A regulatory regime that grants authorities the power to “buy back” fishing rights from fishers at a specified price constitutes another example of this rule.<sup>47</sup>

Conversely, it is possible to vest in the same party both the entitlement itself, and the option to make the other party buy the entitlement at a specified price. In this case, the party holding the entitlement also holds a “put” option to force its sale at an objectively determined price.<sup>48</sup> For example, a party harmed by another party’s conduct can choose to stop the harmful

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<sup>43</sup> This approach is known as Pigouvian, after its pioneer, Arthur Pigou. See ARTHUR CECIL PIGOU, *WEALTH AND WELFARE* (1912). While Coase showed that such a system of public intervention into prices through the tax system was not necessary to achieve efficient results in the absence of transactions costs, see Coase, *supra* note 18, it remains a potentially useful option where transactions costs are positive – which of course, they always are.

<sup>44</sup> See, e.g., Madeline Morris, *The Structure of Entitlements*, 78 CORNELL L. REV. 822, 852-54 (1993) (discussing liability rules as call options); Carol M. Rose, *The Shadow of the Cathedral*, 106 YALE L.J. 2175, 2178-79 (1997) (observing that a liability rule is the equivalent of a property rule combined with an option); Ayres & Talley, *supra* note 7, at 1041 & n.49 (observing that under a liability rule, the defendant holds a call option).

<sup>45</sup> 257 N.E.2d 870 (Ct. App. N.Y. 1970).

<sup>46</sup> 494 P.2d 700 (Ariz. 1972). It is not clear, however, that the developer, Del E. Webb, actually had an option to permit the pollution to continue, if the losses it caused him were less than the price of moving the feedlot. The court noted that this was a public nuisance affecting many individuals who were not parties to the lawsuit (i.e., the homeowners); hence, it does not appear that the feedlot could have continued its operations in such close proximity to housing in any event. See DUKEMINIER & KRIER, *supra* note 31, at 776 (discussing this question).

<sup>47</sup> See John L. McMullan & David C. Perrier, *Lobster Poaching and the Ironies of Law Enforcement*, 36 LAW & SOC. REV. 679, 685 (explaining that the regulatory regime governing lobster fishing in Nova Scotia included a proviso entitling the government to “buy back boats and retire licenses” when a Class A licenced boat stopped lobster fishing) (citing A. Scott & M. Tugwell, *Public Regulation of Commercial Fisheries in Canada -- The Maritime Lobster Fishery*, Technical Report No. 16, Ottawa: Economic Council of Canada (1981)).

<sup>48</sup> See Krier & Schwab, *supra* note 7; Ian Ayres, *Protecting Property With Puts*, 32 VAL. U. L. REV. 793 (1998).

conduct, or receive damages in exchange for continuing to suffer from it. This was precisely the choice offered to the plaintiff in *Pile v. Pedrick*, a case involving a minute encroachment of a wall upon the land of another.<sup>49</sup> While case law does not offer any ready examples of “put” options awarded to the person causing the harmful conduct, we can imagine what such a case would look like. A party such as Spur (the feedlot operator) would be given a choice between continuing its operation unimpeded or accepting an objectively determined amount of money in exchange for moving away. Retirement incentive options offered to employees are a close analog, if these are offered in situations where employees’ continued employment generates costs for the organization, but the employees hold entitlements to stay on the job.<sup>50</sup>

While any combination of calls and puts would be theoretically possible, some of these possibilities seem more plausible than others to operationalize. For example, it is easy to imagine granting individuals a “call option” to engage in a negative externality-producing behavior at a specified price. This is precisely what Rule 2’s “flamingo tax” does. Likewise, the idea of giving individuals a “put option” to force others in the community to buy up benefits they receive from positive externality-producing behaviors is captured by the offer of a subsidy or bounty for the behavior in question. This is illustrated by the choice Rule 5 offers an individual between not landscaping, and landscaping to receive a fee.

Each of these mechanisms has a flip side.<sup>51</sup> The flip side of a landscaping subsidy would involve fining the individual for failing to landscape (Rule 2). In other words, the individual would hold a call option to engage in the nonlandscaping behavior at the specified price. Likewise, the flip side of a flamingo tax would be a subsidy for removing one’s flamingo, or perhaps a subsidy for refraining from putting out a flamingo in the first place (Rule 5). A subsidy for removing extant yard flamingos would have obvious perverse incentives,<sup>52</sup> while a payment scheme designed to reward people for not doing a broad range of potentially harmful things would be administrative unworkable.<sup>53</sup> Hence, the more familiar pairing of taxing negative externality producing behaviors and subsidizing positive externality producing

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<sup>49</sup> 31 A. 646 (Pa. 1895); see Ayres, *supra* note 48, at 815-16. The plaintiff in *Pile* elected injunctive relief, which required the defendant to tear down a wall in order to rectify a tiny incursion into the plaintiff’s property. A possible concern is that spite might cause a party holding a “put” to choose the option most harmful to the other party, rather than the one most beneficial to the choosing party. In some settings, it is also possible that insistence upon injunctive relief is merely a bluff, a prelude to further negotiations in which the plaintiff hopes to capture a larger amount of damages than the court originally specified.

<sup>50</sup> See Samuel Issacharoff & Erin Worth Harris, *Is Age Discrimination Really Age Discrimination: The ADEA’s Unnatural Solution*, 72 N.Y.U. L. REV. 780, 814 & n.176 (1997) (describing the use of retirement incentive plans to remove costly older workers from the workforce).

<sup>51</sup> See Saul Levmore, *Carrots and Torts* in CHICAGO LECTURES IN LAW AND ECONOMICS 203, 204 (Eric Posner, ed., 2000) (observing that “for every penalty designed to affect behavior there is a corresponding reward – and for every reward, a corresponding penalty”).

<sup>52</sup> Cf. Levmore, *supra* note 51, at 208 (giving example of granting rewards to drivers found wearing seatbelts, which could increase the incentive to drive around (belted) and perversely drive up accident costs).

<sup>53</sup> Cf. *id.* at 206-07 (discussing ability to minimize administrative costs by focusing on the smaller of the two possible target groups).



behaviors seems preferable – recognizing, of course, that line between causing a harm and failing to provide a benefit is not always clear-cut, and is contingent on present cultural understandings.<sup>54</sup>

It would also be possible to grant call and put options to the community, rather than to the individual. The community could have a call option to buy up the individual’s right to engage in a particular behavior for a specified fee (Rule 4). Alternatively, the community could hold a put option that offers a choice between banning the behavior and collecting a fee for letting it continue (Rule 6). Figure 3 lays out these options and their associated examples in the neighborhood context, replacing the earlier “liability rule” language with the terminology of “call option.”

Figure 3: Calls and Puts

Rule	Entitlement Held By	Option Type (Party Holding)	Examples
2	Community	Call Option (Individual)	flamingos are taxed; failure to landscape is taxed
4	Individual	Call Option (Community)	the community can remove the flamingo by paying the individual a removal fee; the community can require landscaping by paying the individual a landscaping fee
5	Individual	Put Option (Individual)	individual can keep the flamingo <i>or</i> get rid of it and collect a removal fee; individual can go without landscaping, <i>or</i> landscape and collect a fee
6	Community	Put Option (Community)	community can demand the flamingo’s removal <i>or</i> collect a flamingo tax; community can demand landscaping <i>or</i> collect a tax for failure to landscape

<sup>54</sup> See, e.g., Frank I. Michelman, *Property, Utility, and Fairness: Comments on the Ethical Foundations of ‘Just Compensation’ Law*, 80 HARV. L. REV. 1165, (1967) (discussing difficulty of distinguishing harm producing actions from those that fail to confer benefits in the context of regulatory takings). James Krier provides an example that attests to the malleability and cultural contingency of these categories: When A.C. Pigou pioneered the notion of taxes and subsidies to respectively control and reward behavior producing negative and positive externalities in the early twentieth century, he did not suggest a pollution tax (as he is often believed to have done), but rather a subsidy for pollution control. James E. Krier, *The Tragedy of the Commons: Part Two*, 15 HARV. J. L. & PUB. POL’Y 325, 325-26 n.3 (1992) (citing A.C. PIGOU, *THE ECONOMICS OF WELFARE* (4th ed. 1962)). Krier explains that “[i]n Pigou’s day, clean air was probably viewed as something of a luxury, with dirty air being the norm,” so that “pollution control would be seen as conferring an external benefit or good.” *Id.*

The strength of calls and puts – their facilitation of unilateral entitlement shifts – is also their weakness. In other words, if property rules cater to heterogeneity to a fault, calls and puts do too little to take heterogeneity in subjective valuations into account. Precisely because the transfers can occur over the objections of the other party to the transaction, the person exercising the option need only take account of the exercise price, not the other party's true reservation price. If we cannot tell how much the parties are really harmed or benefited by the exercise of an option, the possibility arises that a tax or subsidy may be either insufficient or excessive relative to the impact of the option's exercise on the other party. In either case, the tax or subsidy replaces one set of flawed "prices" with another

To get some traction on the problem, consider first a case in which the community as a whole knows the mean of the values actually held by the community members, but nothing more.<sup>55</sup> This would still make it possible to set exercise prices that would be correct, on average, for the group as a whole. As a result, the behavior in question could be priced accurately overall, in the sense that we would expect the right amount of behavior to result from it. Yet even if the price is set accurately overall so that it perfectly prices the behavior in question (resulting in just the right amount of it), it can produce troublesome distributive impacts within a heterogeneous group. For example, the people in the top row of Figure 2 are not bothered at all by flamingos, and so would receive a windfall if given a share of the taxes collected. This windfall is made possible by losses inflicted on those who are bothered by flamingos to a greater degree. Obviously, this problem would diminish with increased homogeneity among group member valuations, and increase with increased heterogeneity among group member valuations. Moreover, if each person is, by turns, sensitive and insensitive to various impacts, and if the taxes and subsidies get it right on average for each impact, the windfalls and shortfalls may roughly balance out for a given individual. If, on the other hand, some people are uniformly ultra-sensitive (or ultra-insensitive) across the entire range of impacts, the distributive implications may be more troubling.

More likely, however, even the mean of the community members' true valuations is unknown. In that case, setting the exercise prices becomes difficult. If the prices are set wrong, then there would be problems not only of distribution but also of allocative efficiency. The problem could be avoided if there were a reliable mechanism for eliciting true preferences from the community members. Can the community members be trusted to convey their true valuations in the context of a proposed liability rule? The situation is in one sense more promising than in the usual two-party case where the polluter and the victim are separate entities. Here, the community members must weigh their own interests as potential flamingo-taxpayers against their interests as potential collectors of the flamingo-tax and recipients of the benefits associated with flamingo control.

To put it slightly more formally, each person prefers a tax will maximize the following equation, where  $B_f$  is the benefit associated with flamingo reductions,  $B_t$  is the person's share of the collected flamingo tax revenues,<sup>56</sup>  $L_t$  is the person's tax liability and  $L_f$  is the person's subjective loss associated with choosing to remove flamingos (instead of paying the tax):

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<sup>55</sup> The assumption I am making here is analogous to ones made in the analysis of two-party interactions. See Avraham, *supra* note 18, at 9.

<sup>56</sup> I am initially assuming that these will be costlessly redistributed on a per capita basis to the community members; later, I will consider a case where the taxes are consumed in enforcement activities.

$$(Bt + Bf) - (Lt + Lf)$$

Consider the checks that this equation places on community member representations, going cell by cell through Figure 2. Initially I will assume, counterfactually, that enforcement is costless and perfect; I will later relax this assumption.

*Cell I:* For these people,  $Lt$ ,  $Lf$ , and  $Bf$  are all zero. This is because they neither value the reductions of others' flamingos, nor value their own flamingo rights. Thus, they have nothing to gain from a tax that changes others' behavior, and nothing to fear from a flamingo tax. Therefore, the goal for people in cell one is to maximize  $Bt$ , their share of the tax revenues, which means agitating for the tax that will yield the highest total revenue.<sup>57</sup> This does not merely mean pressing for the highest tax, of course; a too-high tax is likely to spur behavioral changes (of no value to people in cell one) rather than revenues. In order to advocate for the revenue-maximizing tax, they will have to overstate the costs that flamingos impose on them somewhat (since, in fact, they suffer no harm at all, but want there to be a positive tax on flamingos for revenue-raising purposes). But their overstatement will be constrained by the concern that raising the tax too high will yield them a tedious flamingo-free landscape, rather than cash.

*Cell II:* For these people,  $Bf$  is zero. They therefore gain no benefit from flamingo reductions. They do value flamingo placement, however, and will either have to pay a tax or suffer a loss. It is true that they will share in any tax revenues that are collected, but if we assume that the community includes some people who pay no flamingo taxes but share in the revenue created,  $Bt$  will always be lower than  $Lt$ . Therefore, increasing  $Lt$  means increasing a negative number that will not be fully offset by the increasing positive number,  $Bt$ . As a result, people in Cell II would prefer a tax of zero. This, in fact, aligns with their actual preferences; they are not harmed at all by the presence of flamingos.

*Cell III:* For these people  $Bf$  is zero, while  $Lf$  is very large. Their reasoning will precisely align with that of the people in Cell II – a zero tax is best. Once again, this matches their subjective valuation.

*Cell IV:* For these people,  $Lt$  and  $Lf$  are both zero.<sup>58</sup> Therefore, the goal for people in cell four is to maximize the sum of  $Bt$  and  $Bf$ . This will occur when the tax is set at a level that just compensates them for their harms. They have no incentive to overstate those harms, because the result would be a tax that would be too high, in that it would give them more flamingo reduction and less tax revenue than they want.

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<sup>57</sup> This is, of course, in tension with the goal of a Pigouvian tax, which is not to raise revenue but rather to appropriately reprice behavior.

<sup>58</sup> In other words, they have no desire to place flamingos, and hence will not suffer from either having to pay a tax or curtail their flamingo use.

*Cell V:* Initially, it might appear that people in Cell V would have an incentive to push for an Lt that is lower than Lf. However, this tendency is counterbalanced by their concerns with Bf, the gains associated with flamingo control in the neighborhood, which they will enjoy. Because of this countervailing factor, they do not have an incentive to understate the harm they suffer from flamingos. If they do understate it, they will pay a lower tax, but there will also be too many flamingos. In other words, they will not be fully rescued from their Prisoner's Dilemma unless they ask for a tax that makes flamingo owners pay for the damage they cause.

*Cell VI:* Here, the reasoning remains the same as in Cell V. The difference is that these people value flamingo placement highly enough that they will engage in it and pay the tax, if the tax is set properly. They too have no incentive to understate the harm that flamingos cause them, even though it would mean paying less tax.

*Cell VII:* For these people, Lt and Lf are both zero. Therefore, they will concern themselves only with maximizing the sum of Bf and Bt. Because Bf is so large for these people, they would want a prohibitively high tax. However, this is no exaggeration; it matches their subjective preferences.

*Cell VIII:* Once again, Bf is so large that a prohibitively high tax would be urged, again honestly. These people would prefer a tax so high that they would be unwilling to pay it, because of the large harms they suffer from the sight of other people's flamingos.

*Cell IX:* Here, the strategy is to push for a tax so high that no other individual would be willing to pay it. If someone is indeed in this position, she would have no reason to overstate her harms, for she wishes only to set the price high enough to discourage everyone else.<sup>59</sup> Once that is accomplished, raising the tax only raises the amount that this individual would have to pay.

The surprising result, then, is that under these assumptions many community members will be inclined to report honestly their subjective valuations when a liability rule is being devised, if the tax revenues will be redistributed among them on a per capita basis. It is true that some members, notably those in Cell I, will overstate the harms they suffer, but even these excesses are subject to a check; if the Cell I people become too greedy, they may end up with a flamingo-free landscape, and no money in hand.

To this point, I have been assuming away enforcement and administrative costs. Such costs obviously exist in any real system. One possibility is that the community would devise a centralized enforcement mechanism, such as an homeowners association, and communally fund it. Heterogeneity among the community members in terms of their valuation of these enforcement services, and strategic understatement of the benefits one will in fact receive, could make this difficult. Another possibility is to use the flamingo taxes to fund the enforcement and administration of the system. This would reduce (perhaps eliminate) the tax shares returned to the community.

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<sup>59</sup> See *supra* note 35 (discussing fact that only one person can occupy Cell IX, and that the presence of such a person makes logically impossible the presence of anyone in Cells III, VI, VII, or VIII).

If we assume that enforcement and administration consumes all of the tax collected, it simplifies the equation confronting the community members to:  $B_f - (L_f + L_t)$ . No longer motivated by a desire to maximize tax revenues, the people in Cell I would no longer have an incentive to overstate their harms from flamingos. However, the people in Cell IV would now just be seeking to maximize  $B_f$  (since  $B_t$  has dropped out of the equation) and would probably overstate the harm they suffer from flamingos in order to urge a higher tax and more flamingo reduction, since they are no longer constrained by their concern about the lower tax revenues that a too-high tax might generate. However, because they will benefit from the enforcement services purchased with the tax revenue, they will not want to falsely advocate a tax so high that it generates no revenue sufficient to enforce the tax.

A similar concern confronts those urging a prohibitively high tax because of their true subjective hatred of other people's flamingos (that is, the people in the bottom row). Because a tax that is prohibitively high will generate no revenues, the provision of enforcement services would remain a collective action problem. By revealing their true valuation of the enforcement in asking for the tax to be set quite high, they would then be opening themselves up to claims that they should bear a larger share of the enforcement costs, and accordingly weakening their ability to bluff others into providing enforcement. Having revealed that they place a high subjective value on flamingo control, they cannot very well pretend that they do not care whether the flamingo tax is enforced or not. Therefore, if more than one person occupies the bottom row and each is aware of the other, each might publicly reveal only a moderate dislike of flamingos in the hopes that someone else will express a stronger preference, secure the prohibitively high tax, and foot the enforcement bill. The situation is a Chicken Game because each would be better off going ahead and paying for the enforcement after revealing the high valuation.

While some degree of inexactitude and dissembling seems inevitable, the problems associated with subjective valuations in the context of setting an exercise price appear less daunting than those that accompany the transfer of entitlements protected by property rules. This does not mean that setting exercise prices in a commons is simple. Technical problems arise in setting the price appropriately if there are increasing or decreasing marginal impacts associated with each unit of externality-producing or surplus-producing behavior. The production function associated with a harm or benefit in the neighborhood will not always follow a linear pattern in which each additional exercise of the behavior adds or subtracts an equivalent unit of value. Incursions into the resource may have a cumulative positive or negative effect that exceeds the sum of the individual impacts. Hence, an exercise price that is appropriate for the first unit of a particular activity may become inappropriate for the tenth unit of that activity. Determining the true shape of the curve requires knowing the parties' subjective valuations in much greater detail.

We have thus far been discussing call options held by individuals (Rule 2). Alternatively, call options held by the community (Rule 4) could facilitate creation of a neighborhood entirely cleared of some particularly obnoxious intrusion (such as flamingos) or completely filled with some particularly pleasant sight (such as landscaping) by buying up the rights of others to engage in the obnoxious action or to refrain from the helpful action. However, the same problems of preference revelation and aggregation will occur internally within the community before it can act as a body. To the extent these problems are suppressed by voting rules or other mechanisms, the risk of an inefficient buy-up exists.

### III. Designing Entitlements for the Commons

In this last part, I want to briefly sketch some of the ways that careful consideration of the special features of a commons can inform the choice of rules for protecting entitlements, and can help in engineering new solutions. I begin with some ideas for mechanisms that modify or combine the entitlement rules discussed above. I present these only as preliminary ideas to prompt further debate, not as actual proposals for implementation. The last subpart makes some observations about the interplay between norms and entitlements in a commons.

#### A. A Schedule of Calls and Puts

The first possibility builds on the voluntary sorting that often accompanies the formation of a group around a common pool resource. Some central figure, such as a developer in a common interest community, could prepare a price list that gives new residents full information about the taxes and subsidies that will accompany various activities within the neighborhood.<sup>60</sup> This serves three purposes. First, it increases homogeneity of the group with regard to the items on the list, for presumably people will not accept a set of prices unless, on balance, it matches with their preferences.<sup>61</sup> Second, it reduces the risk that a community member will be prevented from engaging in an activity that is efficient for her. Third, it avoids the problem of attempting to determine the correct exercise prices based on aggregating the expressed valuations of heterogeneous, and potentially strategic, group members already assembled into the community.

The argument for greater homogeneity is based on an idea that different communities could serve different niche markets.<sup>62</sup> For example, one neighborhood might charge a flamingo tax of \$10,000, and another might charge a tax of \$10. Seeing the list of prices would help prospective buyers sort themselves into the community that is right for them. There are a number of reasons why things may not work out quite as well as this sanguine account suggests. The same claims are made on behalf of restrictive covenants generally, yet many people enter

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<sup>60</sup> Cost of living adjustments might be built into the schedule, but otherwise the prices would remain fixed over time pending adjustment through an established community governance process.

<sup>61</sup> I am assuming here that increased homogeneity is functional in helping the community achieve its collective goals. However, increased homogeneity within the community may inflict costs on those outside of the community and do damage to society as a whole. To the extent that certain activities serve as proxies for wealth or other personal characteristics, differing community rules about those activities may be driven not by different preferences about the behavior itself, but by preferences about association. See Clayton P. Gillette, *Courts, Covenants, and Communities*, 61 U. CHI. L. REV. 1375, 1395 (1994) (explaining that “even where individuals do not have an aversion to certain practices that are prohibited in covenants, such as the maintenance of trailer homes, they may believe that there is a correlation between the subject of the covenant and characteristics that can serve as the basis for a desirable affinity”).

<sup>62</sup> See, e.g., RICHARD A. MUSGRAVE, *FISCAL SYSTEMS* 299 (1969) (positing that “it is efficient for people with similar tastes in social goods to reside together”); Charles M. Tiebout, *A Pure Theory of Local Expenditures*, 64 J. POLIT. ECON. 416, 422 (1956) (presenting a theory of local government in which citizens shop for the community that offers them their preferred bundle of services and amenities).

communities without paying much attention to restrictive covenants, and find out too late that their preferences are at odds with the prohibitions. Moreover, one is always making a bundled choice when one purchases a home in a particular neighborhood, and the price list may not be among the most salient features in the decision. Still, it is possible that people pay more attention to lists of prices than to lists of prohibitions, especially if the background expectations that they bring with them to the home purchasing context make them disbelieve that the prohibitions would really be enforced against them.

The second argument, a reduced risk of inefficient blocking of activities, depends on people matching themselves up reasonably well with a community whose price list matches their preferences. One problem that such an approach has in common with covenants that simply prohibit activities is that people's preferences will change over time. However, if preferences swings are drastic enough, then people would find it worthwhile to simply pay the price and engage in the activity in question; that option is not available to people living under prohibitions, at least insofar as injunctive relief is available, rather than merely damages. Provided that the tax in question is lower than the cost of exiting the community altogether, the person is better off in a world with the tax than in a world with a prohibition. Moreover, given the spillover effects associated with long-term residency, so is the neighborhood.

While there are reasons to believe that the schedule of calls and puts outperforms a property rule in a commons setting, it also appears that a preprinted schedule would have some advantages over a later-determined set of exercise prices. For one thing, it permits leveraging the centralized figure of the developer into a coordination role, rather than requiring later coordination among community members. It also prevents the sorts of coalition shifting that can lead to cycling of votes.<sup>63</sup> Finally, it short-circuits the problem of strategic misrepresentation of valuations. The downside, of course, is that the community as a whole might later gain new information that would make it want to rethink the original prices that it set. It could still do this, of course, if its governance structure permitted it to, but the original "starter set" of prices would already be in place as a default. The value of this depends on how great the risk of a tragedy of the commons is in the absence of such pricing, the presence or absence of nonlegal controls on that risk, and the magnitude of the potential losses that might be associated with it.

## B. Hybrid Solutions

Recent work building on *The Cathedral* has examined pairing rules together, so that each of two parties gets a choice of two options.<sup>64</sup> The purpose for doing this is to better harness private information in settings where the parties cannot (or will not) bargain. The idea has been worked out in the two-player setting only recently, and has not yet been applied to the commons setting. Here, I want to briefly explore the intuition behind such combinations and consider whether they would work in our neighborhood commons example.

One possibility would combine Rules 2 and 6 from the taxonomy in Figure 1. To return to the flamingo example, *both* the community and the individual would confront a choice between having the individual pay a tax (and keep the flamingo) and having the individual get rid of the flamingo (but pay no tax). If both choose the tax, then the tax is paid and the flamingo stays. But if either one wants to get rid of the flamingo, then it is removed, and no tax is paid. If

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<sup>63</sup> Arrow.

<sup>64</sup> See Ayres & Goldbart, *supra* note 7; Avraham, *supra* note 18.

the flamingo stays, then evidently two things are true: the flamingo displayer values the right of display above the tax amount, and the community values the tax revenues above getting to remove the flamingo. In other words, we know that any existing flamingo is an efficient one, in that it is valued by its displayer more than it harms the community. Is the converse also true? Can we assume that any flamingos removed were inefficient ones doing more harm than good? We know from removal only that one of the following is true: that the community valued removal more than the tax price, or that the individual valued the flamingo less than the stated tax price.<sup>65</sup> If both were true, we would know that the flamingo removal was efficient. If the individual made the choice to remove the flamingo in lieu of paying the tax, and if the tax perfectly tracked the social harm generated by the flamingo, then we would also be able to say that the removal was efficient. But if the tax were even a little bit too high, then we cannot know for sure; perhaps the person would have paid a slightly lower tax that tracked actual social harm. If the community made the choice to require removal of the flamingo in lieu of collecting the tax, this suggests that the tax was set lower than the harm the community actually suffered. If the individual was willing to pay that tax, the individual might have been willing to pay a higher tax that actually tracked the social harm. Nevertheless, the margin for error is less than in the case where just one party is offered a choice.

Another possibility would be a “callable call option” This would combine Rules 2 and 4 from Figure 1. As in the ordinary Rule 2, individuals would hold call options to engage in the conduct in question upon payment of an objectively determined tax. However, they could choose to pay a higher tax that matched with their private valuation of the privilege instead. Thus, a Bella who highly values flamingo placement could choose to pay not just the tax set by the community (say, \$500) but some higher amount, such as \$650, which still leaves her with a surplus, given her extraordinarily high valuation of flamingos. To understand why anyone would voluntarily choose to pay a higher tax than required, we must look at the “callable” feature I have in mind for this call option. Recall that under Rule 4, the community has the power to order the flamingo’s removal upon payment of a removal fee. The community could, therefore, be granted a call option upon the condition that the “removal fee” it must pay to any particular community member must consist of a refund of all of the tax monies paid by that individual in order to engage in the activity. Hence, if Bella had paid \$650 in tax to keep her flamingo out, the community could, at some later date, decide to buy up that right – but it would have to pay her not just the going tax rate of \$500, but rather the amount she had paid in: \$650.<sup>66</sup> If the community wished to reduce the overall flamingo population in the neighborhood, but had several people who had only paid in \$500, it would choose to buy back their flamingo rights over Bella’s.

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<sup>65</sup> Actually, we do not even know that much, if the repeat play commons setting (unlike the interaction between two litigating strangers) is likely to afford later opportunities for negotiation. The community might actually value remove less than the tax price, but recognize (from the choice made by the individual) that the individual values it more than the tax price, and hope to extract a greater share of the surplus in some later interaction. However, I will assume for present purposes that this is not the case.

<sup>66</sup> This idea is similar conceptually to the suggestion that homeowners be asked to set their own value for their properties, which would be used both for purposes of property tax collection and for compensation in the event that the state chooses to exercise its power of eminent domain.



The callable feature of this mechanism provides a way of addressing the problem of changing community impacts or preferences over time— the rights can simply be bought back up at some later date by refunding the taxes. Moreover, the “set your own tax” feature helps to protect those with particularly high valuations from being subjected to inefficient transfers. As intriguing as this mechanism is, however, it does not eliminate the internal governance issues that confront a community in deciding on a buyback in the first place.

### C. De Facto Entitlements

Social norms and similar factors can introduce additional de facto entitlements into the commons. For example, a norm might discourage taking more than a certain amount of fish or making noise above a certain level. Alternatively, a norm might reward certain behaviors with positive spillovers on others. Such factors can cause actors to partially or wholly internalize the externalities associated with their actions. One way to conceptualize what is happening is to understand the group’s norms as endowing the collectivity with an entitlement that is protected by a liability rule. The exercise price is the psychic cost associated with violating a norm. Interestingly, in a norms-based system, the “exercise price” can be finely calibrated to match the externalities involved without the need for any special schedules or calculations; the level of social opprobrium simply rises with the costs inflicted, just as the level of approbation rises with the benefits bestowed.<sup>67</sup> It is also possible that group members, or some subset of them, will hold the equivalent of “property” entitlements -- the ability to keep any member from using the resource without her consent or permission, whether tacit or explicit.

Another source of de facto entitlements arises out of the political process. In the case of land uses controlled by zoning, the political clout of interested neighbors or moneyed interests may play an important role in determining whether a particular use is permitted or banned. In the smaller-scale political realm of a homeowners association, de facto entitlements may inure to the benefit of the most troublesome, vocal, or popular portions of the community.

While the role of de facto entitlements in common and interdependent resources is a vast area of study that I cannot begin to broach here, it is important to recognize potential interactions between de facto and de jure entitlements in formulating de jure responses. One possibility is that a system of de jure entitlements will simply be overridden in all cases by the de facto system, so that engineering a de jure system is pointless and irrelevant. If this were the only possibility, the foregoing discussion will have been in vain. However, there are three other possibilities that seem at least equally plausible. First, a de jure system of entitlements could reinforce, stabilize, and formalize a preexisting de facto system of entitlements.<sup>68</sup> Whether or not this is an improvement depends on normative judgments about how well the existing system satisfied the criteria one finds important, such as distributive justice or allocative efficiency, and how the added features of a legal entitlement impacts on factors such as the adaptability and flexibility of the system. Second, a de jure system of entitlements could operate as an emergency

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<sup>67</sup> This is another way of putting the point that people in close-knit groups may be in a better position to incentivize each other than are strangers or distant governments. *See generally*, Daryl J. Levinson, *Collective Sanctions*, NYU Law School, Public Law Research Paper No. 57 (March 2003) available at [http://www.ssrn.com/abstract\\_id=389980](http://www.ssrn.com/abstract_id=389980).

<sup>68</sup> *See, e.g.*, Arti Kaur Rai, *Regulatory Scientific Research: Intellectual Property Rights and the Norms of Science*, 94 NW. U. L. REV. 77, 84 (1999).

backup to a system of de facto entitlements. Under this model, the de facto entitlements provide day-to-day guidance in resource use, and the de jure entitlements are called in only when this proves unavailing.<sup>69</sup>

The third possibility is that a de jure system of entitlements would actually displace or replace the preexisting norms-based system.<sup>70</sup> This might be deemed desirable if the new system performed better on important criteria. However, vestiges of the previous norm-based system may come into conflict with the new legal rules, generating enforcement challenges.<sup>71</sup> Moreover, where the de facto system itself fosters important intra-community interactions that have consequences beyond questions of resource allocation, displacement of the system is not costless. For example, an overly codified regime governing every interaction with one's neighbors might take away much of the generosity and trust usually associated with neighborly behavior – and, in the process, some additional benefits associated with neighborliness might be lost.<sup>72</sup> Here, it becomes important to assess the value of the relationships fostered through the de facto system, and the added value that might be associated with the easier attainment of other ends through those relationship networks. It is possible, of course, that a de facto system could foster relational networks that are turned to pernicious ends; in this case, the displacement of the system might constitute an added bonus rather than a countervailing cost.<sup>73</sup> In any event, it is impossible to determine the appropriate legal response to a common interest tragedy without considering the role of de facto entitlements and the likely results of introducing a de jure entitlement system.<sup>74</sup>

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<sup>69</sup> This is a common strategy in repeat play contract interactions. One set of more relaxed practices prevails while the relationship is ongoing, and another set of rules is used when the parties reach an impasse or an “endgame” state. See, e.g., Lisa Bernstein, *Merchant Law in a Merchant Court: Rethinking the Code's Search for Immanent Business Norms*, 144 U. PA. L. REV. 1765, 1796-98 (1996) (discussing differences between “relationship-preserving norms” and “end-game norms” used by merchants in the grain and feed industry).

<sup>70</sup> See, e.g., Rai, *supra* note 68, at 84.

<sup>71</sup> McMullan & Perrier, *supra* note 47, at 704-05 (explaining how traditions of access to lobster fishing come into conflict with the present regulatory regime, and observing that “communal poaching has emerged as a form of everyday resistance to state regulation”); see *id.* at 687 (defining “communal poaching” as a low-intensity form of poaching by local people for consumption purposes).

<sup>72</sup> See, e.g., Paula A. Franzese, *Does It Take a Village? Privatization, Patterns of Restrictiveness and the Demise of Community*, 47 VILLANOVA L. REV. 553 (2002)

<sup>73</sup> For example, a tight-knit group might practice exclusionary practices or violence against outsiders in order to maintain a monopoly position, or it might pursue other ends, such as organized crime, building on the organizational structure developed around a common pool resource.

<sup>74</sup> In the case of residential neighborhoods in developed countries, it is not typically a question of intervening into a purely norm-based de facto system with a de jure intervention. Instead, there is typically already a set of de jure entitlements in play that might be altered. Nevertheless, some of those alterations could impact on de facto entitlements that have sprung up in response to perceived shortfalls in the previous de jure system.

One additional point about the interplay between norms and law in the neighborhood context bears mention. Cooperation is more likely in settings featuring repeat play,<sup>75</sup> and neighborhoods provide an ideal context for gleaning the fruits of sustained, stable interactions. Yet one of the frequent responses to difficulties in the setting of legal entitlements in neighborhood settings -- that anyone who is made too unhappy by a given outcome can simply move away -- fails to recognize the site specific and network-specific capital that neighbors build up over time. This is but one component of the subjective value that individuals place on their homes. Because an exit strategy will never allow homesellers to recover their subjective value -- only the fair market value -- this surplus will be lost in the event of a move. Hence, a set of legal entitlements that depends heavily on exit to rectify any problems that emerge will not be well-designed to encourage the kinds of neighborhood-specific investments that are likely to produce important positive societal spillovers.<sup>76</sup>

## Conclusion

The problems of limited access commons are enormously important, and often very hard to solve. As a result, it makes sense to use all of the theoretical tools at our disposal to attempt to gain traction on this set of problems. Yet, the conceptually powerful framework of liability rules and property rules has been underdeveloped in the context of the commons. This paper is intended to offer a provisional step towards filling that gap. The resource I have explored in this paper, neighborhood ambience, represents an interesting case insofar as the proliferation of private neighborhoods should afford the opportunity for fruitful experimentation with different models of entitlement protection. While little experimentation of this sort has materialized, a better understanding of the nature of the conceptual matters involved should serve as a spur to useful innovation. Many of the insights gleaned in the neighborhood might then be extended to other commons settings as well. By the same token, in solving problems of urban interdependence, we should not forget to mine the rich literature on the commons for useful lessons about importance of norms and the interplay of norms and legal entitlements.

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<sup>75</sup> See Claudia Keser & Frans van Winden, *Conditional Cooperation and Voluntary Contributions to Public Goods*, 102 SCANDINAVIAN J. ECON. 23, 31-33 (2000) (presenting empirical work showing increased cooperation in settings where repeated interactions were expected).

<sup>76</sup> Another possibility would be to directly subsidize the investments made in the community, or perhaps more workably, provide increasing bonuses for each year in the community.