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Incorporation Rules

Abstract: Following Calabresi and Melamed, legal theory has employed the property rule/liability rule distinction in order to hone our understanding of existing norms, as well as suggest new ones. This paper suggests an addition to the pantheon in the form of a protocol that we call an “Incorporation Rule”. It is a novel mechanism allowing private parties and courts to combine property rule and liability rule protection where both apply to the same entitlement. Incorporation Rules allow for separating the effects of intertwined property and liability rules, focusing on ex-ante voluntary determination of levels of protection usually adjudicated ex-post. Under the protocol, the entitlement is transferred to a special-purpose corporate vehicle, which then issues tailor-made securities to the owner of the entitlement and to the potential buyer or rivalrous user. In this manner, the entitlement is split along the contours of three basic corporate instruments – heterogeneous capital structure, separation of ownership and control, and an independent legal personality. By relying on these known-and-tested corporate mechanisms, risk and transaction costs are minimized, enforcement is improved, and heterogeneous preferences of individuals can be accommodated. The Incorporation Rule protocol thus allows for flexibility in protecting entitlements while facilitating efficient exchange.

Keywords: Calabresi and Melamed, property rules, liability rules, bilateral monopoly, options

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1 Introduction

Law-and-economics scholarship has dealt extensively with various methods of protecting entitlements to scarce resources. Following the seminal work by

Calabresi and Melamed in the 1970s,¹ a real industry of studies has been developed exploring their insights from various angles and perspectives.² This paper contributes to the literature by introducing a novel way to protect entitlements, which can be added to the current Calabresi and Melamed's taxonomy – an "Incorporation Rule" protocol. An Incorporation Rule protects a disputed entitlement by incorporating it and using the corporate structure to assign certain aspects of control and financial returns to one party, while the residual aspects are assigned to the other party. This is done by collapsing the incumbent owner's self-announced value of the entitlement into a lump-sum of money, or having a court assign such a value objectively, and having that amount become a fixed claim of the incumbent owner against the earnings generated by the incorporated entitlement. Simultaneously, a potential buyer or rivalrous user is made the residual owner of the incorporated entitlement.³ In this manner, the entitlement is split along the contours of three basic corporate instruments: a capital structure, separation of ownership and control, and an independent legal personality. Each of these synthetic legal tools plays an important role in formulating the Incorporation Rule scheme, as the following three examples will explain.

Case I: A group of residents enjoys the view of an open field adjoining their property. A developer wishes to purchase the field and build offices or manufacturing facilities. The residents oppose. This all-too-familiar scenario has generated scores of opinions, with commentary ranging from allocating to the residents a property rule protection (requiring their consent for the development), through protecting them with a liability rule alone (forgoing their

¹ See Calabresi and Melamed (1972). For a thorough discussion and analysis, see Cooter and Ulen (2011:99–106), Posner (2010:68), and Kaplow and Shavell (1996).

² Calabresi and Melamed's work on alienable entitlements introduced the difference between "property rules" and "liability rules". Property rules protect an entitlement by prohibiting its taking unless the owner's consent is obtained. Liability rules protect an entitlement by mandating that any taking be conditioned upon compensation paid to the owner of the entitlement. The amount of the compensation is to be set by a third party, for example, a court or a regulating agency. For a description of the Calabresi and Melamed literature, see Bell and Parchomovsky (2002:1) (describing the evolution of the property rules – liability rules scholarship).

³ The concept of a residual owner (also known as the residual claimant or the residual risk bearer) is borrowed from the theory of the firm to emphasize the nature of the contractual relationship between the seller of the entitlement and the buyer, their conflicting interests, and their incentives with regard to utilizing the entitlement once control of it is granted to the buyer. A residual owner is the one whose interests would be best aligned to utilize the entitlement optimally (constrained only by his own limitations). For a discussion and a more formal definition, see Fama and Jensen (1983:328–329).

consent, but requiring compensation), to denying them protection altogether.⁴ Most real-life scenarios involve mixed results, such as allowing development to a certain extent (e.g. building offices for commercial use) and protecting nearby residents from excessive nuisance (e.g. forbidding manufacturing facilities near residential communities). In such cases, the potentially beneficial deal often fails to be achieved because of an anti-commons problem.⁵ Such is the case where property rule protection is granted to each individual, and collective agreement between all individuals is required for the development to take place. How will individuals' preferences be aggregated and how shall the residents' interests be protected?

Case II: Owners of an industrial park place limits with regard to the types of activities resident businesses may operate, for example, permitted noise levels or the extent of property development. A business is interested in locating its offices, or its manufacturing facilities, in the park, and though currently it can operate within the given parameters, future extensions might require an adjustment of the rules. Though both parties are willing to negotiate potentially beneficial terms, the tenant is unwilling to pay today for uncertain future use, and fears hold-up problems if terms are left open-ended. The potential tenant may also be wealth constrained and unable to pay in advance for future expanded usage.

Case III: Two parties to a nuisance dispute are negotiating over compensation. The tortfeasor is willing to pay, while the tort victim is willing to accept payment and forgo legal claims of injunctive relief. While a deal is in both parties' interest, strategic bargaining and emotional involvement are taking their toll. Offers go back and forth, increasing transaction costs and reducing the surplus to be divided. Each party believes the other to be shading his offer, rendering his own shading a retaliatory maneuver in order to obtain a more equitable distribution of the surplus.

What do these cases have in common? In all the three cases a beneficial deal might be forgone, or some of its potential surplus may be lost, due to a combination of bargaining costs, emotional involvement, uncertainty as to future needs, and current liquidity problems. The mechanism proposed in this paper offers a novel solution to this kind of problem. Building on the work of Calabresi and Melamed and their many followers, we introduce the idea of the Incorporation Rule protocol, which allows a simultaneous combination of property rule and liability rule protections of different facets of a given entitlement – for example, different usages made of the same entitlement.

⁴ See, e.g. Schulz (discussing a case study, the problems it generates and possible solutions).

⁵ For the classic description of the problem, see Heller (1998).

Specifically, the mechanism keeps property and liability components separated, while protecting both within the confines of a single corporate entity. As a result of employing the mechanism, the conventional bargaining environment is to be replaced by a corporate mechanism, which integrates the parties' entitlements and facilitates exchange within a pre-defined framework. This results in reducing bargaining costs, alleviating future concerns of opportunistic behavior regarding possible developments, and overcoming liquidity problems by facilitating financing of productive endeavors. Through either voluntary agreement or a court-ordered decree (depending on the specific context), the entitlement is transferred to a special-purpose corporation, structured with a dual-class (more generally, multi-class) capital structure, mirroring the different facets of asset usage and parties' rights. From an economic viewpoint, such a mechanism facilitates the creation of a menu of options, by which the buyer and seller can coordinate asset usage according to their stated preferences, attitudes toward risk, and liquidity constraints. Moreover, the mechanism allows for the pricing of different types of potential uses made of the entitlement. Indeed, each usage may be protected in a different way, by a property rule or by a liability rule. The method, potential pitfalls, and resultant advantages are detailed below.

The remainder of the article is organized as follows: Section 2 provides a brief literature review of entitlements and rules protecting them, as well as the legal use of real options which are implicit in Incorporation Rules. Section 3 presents the proposed mechanism in detail, formally modeling the interaction and suggesting methods of implementation. Section 4.1 explores the advantages incorporation provides over "regular" contracts. Section 4.2 focuses on the option-making advantages the Incorporation Rule provides. Section 5 concludes.

2 Literature review

Calabresi and Melamed's seminal work on property rules and liability rules⁶ generated a voluminous scholarly effort, which implemented, improved, and developed their basic insights.⁷ The literature that followed was initially focused

⁶ Calabresi and Melamed identified of a third type of rules – inalienability rules. This latter type of rules is less relevant to the discussion here but is important in other contexts. See, e.g. Fennell (2009).

⁷ For a comprehensive overview of the literature, see Farnsworth (2007:188-197) and Smith (2004:1731-1748).

on resolving nuisance disputes and defining real-property rights, but led to applications in many other legal contexts as well.⁸ The recurring problem faced by efficiency-minded regulators is well known: it is impossible to verify or disregard a subjective value attached by owners to their entitlement. While a property rule may be successful in protecting idiosyncratic values attached by owners to their entitlement, the human tendency to behave strategically – for example, inflate such value when bargaining – generates barriers to successful transactions. In this context, the literature extensively discusses the protection of alienable entitlements while comparing obstacles such as hold-outs,⁹ bilateral monopolies,¹⁰ and asymmetric information.¹¹ In contrast, a liability rule may enable efficient transfers of entitlements, since an outsider is asked to determine the price, and thus who gets to use the entitlement, notwithstanding the current owner's will as to its transfer. Liability rules, however, may engender inefficient and unfair results. First, the price of the entitlement is set by a third party, thus potentially ignoring any idiosyncratic value attached by the forgoing owner. Second, transaction costs increase because of the price-setting procedure otherwise avoidable through direct contracting. Lastly, liability rules disregard the current owners' autonomy in that they may wish to avoid the transaction altogether.

2.1 Using real options

One of the lines of research, derived from “One View of the Cathedral,” concerns the use of real options theory to reevaluate the discrepancy between property

8 See, e.g. recent examples: Hylton (2011) (defensive conduct in tort law), Hylton (2012) (criminal law), Rule (2010) (solar access laws), and Lehavi (2006) (land use controls).

9 See Polinsky (1980:1078), *Walgreen Co. v. Sara Creek Properties Co.*, 966 F.2d 273, 278 (7th Cir. 1992) (Judge Richard Posner describes the pervasiveness of the hold-out problem), Heller (1998), Lessig (2001:203, 260), Fennell (2004:983), and Bell and Parchomovsky (2010:1674).

10 See, e.g. Krier and Schwab (1995:465) and Rose (1997:2183).

11 See, e.g. Bell and Parchomovsky (2007:885–890) (discussing the context of eminent domain), Ayres and Talley (1995) (discussing the problem in a general bargaining context), and Keenan and Wilson (1993) (discussing the context of bargaining). Note that in standard accounts of asymmetric information contexts, the informational discrepancy that generates a problem concerns the owner's reserve price for transferring his entitlement. The case at hand raises a preliminary question also with regard to the price of the entitlement itself to others besides the owner. See, however, Wonnell (1991:360–362) (discussing asymmetric information problems with regard to the value of assets).

rules and liability rules.¹² The analysis of liability rules is particularly useful in the context of real options. Both original “Rule 2” (according to which the polluter may continue to pollute but has to pay damages to the victim) and “Rule 4” (according to which the victim can stop the pollution but has to pay damages to the polluter)¹³ are in fact call options, differing only with regard to the identity of the payer and the payee.¹⁴

12 Leading contributions include Morris (1993); Ayres and Talley (1995); Krier and Schwab (1995); Ayres and Balkin (1996); Epstein (1997); Levmore (1997); Rose (1997); Ayres (1998, 2005); Fennell (2005); and Avraham (2004).

13 One of Calabresi and Melamed’s innovative insights concerned the introduction of the four rules menu, which describes a protection protocol crossing the initial allocation of the entitlement (either to the pollutee or to the polluter) with the method of protection (either property rule or liability rule). This menu allowed Calabresi and Melamed to point to an insight – Rule 4 – according to which the initial entitlement is assigned to the polluter but is protected by a liability rule. Rule 4 means that the pollutee can decide to cease the pollution in exchange for compensation paid to the polluter, covering either the polluter’s costs of shutting down or relocating elsewhere. See Calabresi and Melamed (1972:1115-1117). Rule 4 was in fact already suggested in literature sometime earlier in Atwood (1969:315). Both Rules 2 and 4 demonstrate how an holder of an option can buy the entitlement from its holder in exchange for the exercise price.

14 While protecting entitlements with a call option (i.e. an option to buy an entitlement) has been widely accepted, the protection of entitlements with a put option (i.e. an option to sell an entitlement and in exchange be paid a fixed price) has been met with resistance. See Levmore (1997:2160–2168) (criticizing a rule which embodies a put option, allowing the polluter to stop polluting and collect the pollutee’s forgone damages, or alleged gain from cessation) and Epstein (1998) (criticizing the use of financial economics to analyze Calabresi and Melamed). In fact, adding put options into the menu of property and liability rules mandated the recognition of two additional rules to the four already recognized. These rules may certainly prove problematic to anyone who does not envision efficiency as a primary goal. Consider, for example, “Rule 5”, which allows a polluter to choose to either continue polluting or stop polluting and collect damages from the victim. See Krier and Schwab (1995:471–472); Ayres (2005:15). Moreover, the application of the mechanism leads to several distributional effects because it actually splits, sometimes awkwardly, various entitlements between the parties. See Rose (1997:2178–2179). “Rule 5”, for example, makes the victim subject not only to pollution but also to the possibility of having to “buy” from the polluter the latter’s entitlement to pollute. In other words, the victim is worse off when compared with a traditional victim of pollution. Such results have led critics to argue that protecting entitlements with puts is, at the very least, impractical. See Epstein (1997:2093–2094). Nevertheless, real-life examples demonstrating common law use of puts do exist. See Ayres (2005:29–36) (suggesting put options as a solution for nuisance disputes).

2.2 Liability rules revealing information

Once framed as call options, scholars soon understood that liability rules reveal information about the value of the entitlement. The exercise of a call option demonstrates that, for the holder of the option (e.g. the polluter), the entitlement is worth more than the applicable price he has to pay.¹⁵ Refraining from exercising a call option reveals the opposite, that the option is priced above its holder's subjective valuation.¹⁶ Having understood that options can reveal otherwise private non-verifiable information, scholars began to discuss the implications on bargaining strategies and the need for government intervention.¹⁷

2.3 Splitting entitlements to protect them

It has also been recognized that an entitlement can be split along a certain axis – primarily, to facilitate bargaining.¹⁸ Splitting an entitlement in a manner that induces an “identity crisis”, that is, none of the parties can anticipate their role as a buyer or as a seller in the bargaining process, can induce each of them to be more truthful about the value attached to the entitlement. Two approaches have been suggested to induce such an “identity crisis”: splitting an entitlement on the basis of the degree of protection afforded it or along an axis that concerns patterns of ownership. These patterns include parameters of use, space, time, or probability of being acknowledged as an owner.

2.4 Using multiple options

While thinking of a legal entitlement in terms of the option it creates generates powerful insights, using more than one option at a time allows for a more complete harnessing of the parties' private information.¹⁹ What Fennell described as ESSMOs (entitlements subject to self-made options) takes this to the extreme, suggesting a menu of options that would reveal completely the option-holder's relevant valuations, merely by observing which options are exercised and at what price. In this regard, creating a legal regime which

¹⁵ See Fennell (2005:1415–1416). In option terminology, the call option is “in the money”.

¹⁶ In option terminology, the call option is “out of the money”.

¹⁷ See Ayres and Talley (1995:1038–1039); Ayres and Balkin (1996).

¹⁸ See Ayres and Talley (1995:1029–1030).

¹⁹ See Avraham (2004:270) (arguing that the law should employ a pair of options).

facilitates the parties' self-manufacture of options, as opposed to providing them with ready-made ones, improves both information revelation and efficient transactions.

Self-assessment mechanisms, such as the ESSMOs referred to above, manipulate the option-maker's incentives to force him to refrain from strategic behavior and instead pack his true subjective valuation in the exercise price of an option.²⁰ A self-assessment mechanism can be created only if the owner of the entitlement does not know in advance, when declaring the exercise price of the option he creates, whether the exercise price he generates will carry positive or negative implications. Similar to the "I cut, you choose" routine, mechanisms causing the decision-maker to take action while ignorant of its ultimate effect on his own well-being, cause hedging, which takes into consideration multiple potential outcomes from a distinct current choice.²¹

20 See Fennell (2005:1433–1440). Introduced by Professor Fennell as an alternative to the classic property rule – liability rule dichotomy, and building on insights from the literature on self-assessed valuation mechanisms, an ESSMO regulation makes the holder of an entitlement package his true subjective valuation of his entitlement in the form of an option, to be exercised, or not, by another. Thus, an ESSMO creates a liability rule, which enables a unilateral transfer of an entitlement (the other party can unilaterally decide whether to take the entitlement and pay the required compensation), while allowing an entitlement holder to set himself the option's exercise price and thus package into the price his subjective valuation of the entitlement. The ESSMO mechanism overcomes the problem of the entitlement holder's incentive to lie about his true subjective valuation by ensuring that both too-high and too-low valuations will carry negative consequences. To illustrate, consider a classic historical example – the law of general average contribution in Admiralty. Under this rule, shippers are required to place a value on the goods they ship aboard a vessel. In case of a storm at sea, the captain of the vessel might decide to toss some of the cargo to save the ship. Of course, in such a case, the owner of jettisoned cargo would be compensated. The valuation of each shipper serves as a basis to the captain's decision whether to toss the cargo, and later, the compensation payment, if the shipper's cargo was in fact tossed from the vessel. However, each shipper's valuation also serves to decide on the percentage of his participation in compensating the shipper whose cargo was tossed. In short, "Value one's good too low, and they become more likely to be tossed overboard, in which case one will get too little compensation. Value one's goods too highly, and one will almost certainly avoid having them cast into the sea, but one will have to pay proportionately too much to compensate the owners of the goods that were jettisoned". See Fennell (2005:1441). For a discussion of the self-assessment literature, see also Bell and Parchomovsky (2007:891–892).

21 Using the corporate form to generate options has been suggested as a solution to the takings problems, by which eminent domain powers are used to confiscate private property for public use, see Lehavi and Licht (2007). There, the issue tackled is that of under-compensation to original owners due to the liability rule exercised, or taking at (current) market price. Since takings by eminent domain powers often increase property value, they suggest incorporation of the contested asset in order to allow previous owners a fair share of asset appreciation. While

3 Modeling the Incorporation Rule

3.1 Legal structure

Most succinctly stated, the Incorporation Rule protocol works as follows: imagine an asset which is currently usable in a low-intensity way, but includes the possibility of future high-intensity uses as well. A special-purpose corporation is formed to take hold of the contested asset – the entitlement to make use of the asset. Any usage made of the entitlement is to be executed solely by corporate officers on behalf of the corporate vehicle and subject to its pre-determined bylaws. Common-stock shares, with voting rights, are issued to one party (call him: Buyer) in return for a lump-sum payment of x which is paid by the buyer to the corporate vehicle.²² This amount, x , depends on the current value of the entitlement as assessed by the other party (denoted: Seller), in its current, low-intensity, use. Depending on the circumstances of the case, x can be determined either by a third-party decision-maker such as a court of law (when the seller's entitlement is protected by liability rule) or by the parties themselves (when the seller's entitlement is protected by property rule). Nonvoting preferred shares²³ are issued by the corporate vehicle to the seller. If several sellers exist, each is issued a percentage of these shares, in accordance with their relative ownership of the original entitlement. The seller also announces the amount y that he is willing to accept in order to be bought out completely, granting the buyer unlimited discretion as to the use of the entitlement and eventual high-intensity usage.

they do not directly phrase their suggestion in the language of real options, the result is similar. Despite superficial similarities, their suggestion is a very narrowly-construed private case of the general mechanism we propose. To illustrate the difference, consider the taking in eminent domain scenario: according to the Incorporation Rule protocol, when applied to this case, the residents should not become the residual owners of the corporate vehicle (holders of common stock shares) but rather a preferred share holders. The common stock shares should be allocated to the state.

22 As will be explained shortly, the amount x can be dictated in some cases by the court (establishing a liability rule protection for the seller's basic entitlement, e.g. in cases such as I), or in other cases can be agreed upon by the parties (establishing a property rule protection for the seller's basic entitlement, e.g. in cases such as II).

23 Preferred shares can be explained as a hybrid of the two basic patterns of financing used by the firm, which are common stock (equity) and debt. See, e.g. Klein and Coffee (2004:302). The primary purpose of a preferred share is usually to give its holder the entitlement to a dividend of a specific amount, which precedes the entitlement of the common shareholder, while preserving the preferred shareholder's claim as a residual rather than as a fixed one.

Obviously, the announced value of y shall include an attempt by the seller to capture at least some of the surplus to be generated as the entitlement is directed to new and higher-intensity uses. The seller's stated amount of y is designated as the preferred-share coupon, which must be paid before the buyer can enjoy any corporate dividends resulting from the high-intensity use made of the entitlement. If several sellers exist, y is determined in a preferred shareholders' meeting by a majority vote, subject to market transactions between shareholders and potential buyers (facilitating cashing-out by low-valuation or lower willingness-to-risk shareholders and purchase of voting power by high-valuation ones).

Corporate bylaws are drafted to limit the usage of the entitlement to its most basic, low-intensity, level (for which x was paid by the buyer). Increasing the usage of the entitlement is possible by changing the corporate bylaws provided that resulting corporate profits are allocated first to pay the preferred-share coupon. Officers of the corporate vehicle, as fiduciaries to the corporation, manage the entitlement in the designated usage, under a duty to obey the bylaws (whether the bylaws dictate the low-intensity usage or the high-intensity usage), and are exposed to personal liability for any failure to do so.

The seller (or sellers) is the first to enjoy profits accruing from extended usage of the entitlement, thus the buyer de-facto must agree to the seller's terms in order to increase usage intensity. However, if the sellers announce an excessive y , the buyer (who holds the common-stock shares) will not invest in upgrading the entitlement and would effectively enable only low-intensity usage. Eventually, buyers wishing for full discretion as to the usage of the entitlement cause the corporate vehicle to distribute a preferred-share dividend according to the coupon value announced earlier by the sellers, cashing them out and leaving the buyer as the sole equity holder. Funding such a buy-out is achieved either by the buyer himself (when he wishes to purchase the entitlement outright) or from corporate income created by the extended usage he seeks. Thus, "buying-out" the sellers necessitates sharing some of the proceeds generated from any new usage of the entitlement – up to the amount of y . On the other hand, if the contested entitlement is employed only in its low-intensity usage, the sellers, as preferred shareholders, would enjoy a dividend of only x (thus, even if the amount of x is in dispute, the parties can share the risk of extracting it).

This formulation allows for separating different types of use to which the contested entitlement may be put and for protecting each usage with a different rule. In non-voluntary circumstances like *case III* above, a court might determine the appropriate compensation x for a nuisance created. In wholly voluntary circumstances, such as *case II* above, the current use is contracted for (i.e. x is agreed upon by the parties), while creating an option for future extended uses. Thus, the buyer pays only for the usage currently required, while avoiding future hold-up problems when extensions might be called for. Where circumstances

require a mixing of voluntary and non-voluntary interactions, such as *case I*, courts might specify a liability rule protection for the basic usage (in the amount of x) and a property rule protection for any extensions (allowing sellers to announce y themselves – or even different y s matching different usages). Note that in all cases the social planner may also accord an inalienability rule protection for the seller's entitlement, to the extent that certain usages of the contested entitlement are prohibited altogether.

In all cases, the corporate mechanisms employed under the auspices of the Incorporation Rule protocol reduce transaction costs and alleviate bargaining problems. These goals are accomplished, first, by positing multiple owners of the entitlement as shareholders, thus transforming an anti-commons problem into one of collective decision-making. The general meeting of shareholders becomes the venue for aggregation of distinct preferences and for resolving disputes by a majority vote. Moreover, differences between the various owners of the entitlement can be captured by allocating a corresponding portion of the shares to one owner rather than to the other. Furthermore, the possibility of a streamlined trading of the entitlement opens up, as the original entitlement is transformed to a standardized share with attached monetary value. A market can easily evolve, with each seller trading his share for cash and exiting rather than having to wait until y is accrued in the future.

Second, having sellers specify the y amount they require in exchange for allowing high-intensity usage allows them to create a call option for the buyer, so that his uncertainty regarding future developments is alleviated. When considering an initial investment to upgrade the entitlement and move toward the high-intensity usage, the buyer no longer has to fear future hold-up.

Third, financing problems are mitigated and possible risks associated with employing the entitlement in the high-intensity usage can be shared. Indeed, under an Incorporation Rule protocol the buyer does not have to pay the seller upfront the value of y in order to opt for high-intensity usage. Rather, the seller is paid y from corporate profits, if and when they accrue as the contested asset is employed in the high-intensity manner. Similarly, since the buyer does not have to pay the seller upfront, both the buyer and the seller share the risks associated with changing asset usage. This aspect can change according to circumstances, by determining the timing and source of the preferred-share dividends within the corporate bylaws, thus facilitating case-specific adaptation according to the parties' preferences.

Fourth, having the seller write an option for the buyer, and having the buyer respond to the option, generates a take-it-or-leave-it (TIOLI) scenario, pushing the parties (albeit imperfectly, as discussed in the next sections) to disclose their true valuations of the entitlement. For example, an "excessive" amount of y

announced by the seller will be perceived to be a revelation of the seller's preference for maintaining the entitlement in its current low-intensity usage. This brings to bear both the literature on option-making and the reduction of risk which facilitates a contractual agreement. In the next sections, we address each step in forming the mechanism, as well as its applications and potential drawbacks.

Naturally, protecting an entitlement with an Incorporation Rule generates costs of its own. These costs can be generally described as the agency costs associated with managing and controlling the entitlement within the framework of a corporation. However, the efforts to minimize agency costs are streamlined and regulated by corporate law norms, so that the costs associated with Incorporation Rule protection may occasionally be lower than the costs associated with any other form of protection – be it property rule, liability rule, or any combination thereof.

3.2 Economic form

Obviously, the social planner's final decision on the form of protection for a given entitlement depends on a comparative evaluation of the relative costs associated with each form, focusing especially on the transaction costs of transferring the entitlement to its most efficient user. When the transaction costs of a property rule are high, for example, due to strategic bargaining or coordination problems (when the entitlement is controlled by multiple owners), an Incorporation Rule protection may be preferred. Beyond relative transaction costs, the social planner must take account of the costs of third-party mistakes (such as courts assessing the appropriate liability or compensation required), rendering the comparison more complex.

The model proceeds stepwise, introducing the sellers' maximization problem in choice of the preference coupon and the buyer's choice of whether to opt for high- or low-intensity usage. We begin with a discrete choice of entitlement usage, inducing two possibilities for firm profitability (Π_{FH} and Π_{FL} for profits from high- and low-intensity uses, respectively). After developing the discrete case, in Proposition 2, we highlight potential inefficiencies from incomplete information and heterogeneous evaluations of firm profitability. The introduction of the mathematical model interspersed with verbal explanations stems from our focus on the structural parameters of the protocol, rather than on a specific functional form of firm profits (expected to depend on case-specific circumstances, later on denoted as a vector of exogenous variables). Our model allows for multiple sources of transaction costs, including contracting

and enforcement (TC_1), strategic bargaining (TC_2), aggregation of preferences where simultaneous owners create an anti-commons problem (TC_3), and emotional effects (including endowment effects as well as animosity) (TC_4).²⁴ Incorporating the entitlement allows for relying on corporate law mechanisms which facilitate contracting and enforcement (reducing TC_1), transform sequential bargaining into a one-time TIOLI offer (reducing TC_2), and provide voting rules allowing for aggregating preferences as well as rationalizing them (reducing TC_3 and TC_4).

Incorporation, of course, comes with costs of its own, denoted with TC_I . The Incorporation Rule is thus efficient as a transaction-cost lowering device if and only if the added costs of incorporation are lower than the transaction costs saved along the four dimensions noted:

$$TC_I < \sum_{i=1}^4 TC_i \quad [1]$$

As per the examples above, the sellers are assumed to be a group of owners exchanging the entitlement for preferred shares, while the buyer is assumed to be a unitary purchaser, whether individual or a firm (of course, nothing prevents the model from being applied to a group of buyers as well).²⁵ Profits for each (assuming trade takes place) are denoted by Π_S and Π_B , respectively (with Π_F denoting the firm profit). Assuming high-intensity usage, the sellers initially receive x and profits are allocated thereafter, up to their chosen y . Thus they can expect to achieve profits in an amount between x and y , depending on the success of the firm. The buyer pays x at the outset in order to purchase the common stock of the firm and manages the firm with no return until satisfying the preference coupon. Thus, the buyer can expect a positive return if firm profits exceed the sum of his initial investment x or the ex-post payment y to the preferred shareholders, depending on the use made of the entitlement. Firm profits exceeding this sum are allotted to the buyer.

Formally,

$$\Pi_S = \max\{\Pi_F + x, x + y\} \quad [2]$$

²⁴ Animosity is most often present when bargaining occurs between parties to a pre-existing dispute, see, e.g. Farnsworth (1999:381–384). Endowment effects can serve to create an impasse in bargaining when parties focus not just on the underlying asset but also on the gains from trade. When parties seek “at least a fair share”, and assume the other is shading her offer, they react in kind – leading to the forgoing of a mutually beneficial deal. See, e.g. Babcock and Loewenstein (1997).

²⁵ Further derivations are necessary to specify how the distribution of preferences involved with multiple buyers might influence some of the results obtained herein. We thus focus on the unitary buyer, and issues involving multiplicity are left for further research.

$$\Pi_B = \max\{-x, \Pi_F - x - y\} \quad [3]$$

Both buyer and sellers have an interest in maximizing firm profits in order to maximize their own, though they differ in this respect once $\Pi_F > y$, as seller's profit is bounded above by y while buyer's is not.

Formally,

$$\frac{\partial \Pi_s}{\partial \Pi_F} > 0 \quad \forall \Pi_F < y \quad [4]$$

$$\frac{\partial \Pi_s}{\partial \Pi_F} = 0 \quad \forall \Pi_F \geq y \quad [5]$$

While

$$\frac{\partial \Pi_B}{\partial \Pi_F} = 0 \quad \forall \Pi_F < y \quad [6]$$

$$\frac{\partial \Pi_B}{\partial \Pi_F} > 0 \quad \forall \Pi_F \geq y \quad [7]$$

Under these conditions, until the firm has attained sufficient profits to cover the preference coupon, the sellers are allotted whatever profit is made and buyer cannot recoup the initially invested x . The buyer is thus incentivized to manage the firm efficiently, paying off the sellers in the process.

The model outlined below will develop the structure of the buyer's and sellers' incentives, given that the asset in question is incorporated and can be put to differing levels of usage. We will focus on the discrete case of two modes, high and low intensity, to outline the issues involved. The firm aims to maximize profit with respect to an array of exogenous variables independent from the parties' strategic problem. The model will show both parties have an interest in maximizing profit from asset usage, though potential inefficiencies exist once we relax the assumption of full information.

The model is expository in nature, outlining the structure of the protocol without solving for specific functional forms of the firm's profit function. This is in order to maintain focus on the protocol itself and allow for future extensions modeling specific cases of asset usage.

3.3 Incorporation as defining usage and reducing costs

The main purpose of separating preferred-share holders from common shareholders is to allow separation of the firm's profits into two or more revenue

streams, each connected to the different uses the firm might make of the primary asset. To clarify, assume the asset may be used in one of two ways: a low-intensity usage or a high-intensity usage. The low-intensity usage poses no special externalities, while high-intensity usage externalizes onto neighbors and grants them legal claims. In the baseline example of *case I*, a number of possible uses exist for an open field bordering a residential community. Non-usage leaves the field untouched, granting residents open space. Low-intensity usage allows development, such as erecting low office buildings. High-intensity usage allows for high-rise office buildings, or externality-producing manufacturing facilities. Incorporating the asset and assigning preferred shares to the residents would allow for low-intensity usage by a buyer–developer purchasing the common stock, while high-intensity usage would require purchase of the preferred stock as well, by having the firm distribute dividends covering the preferred coupon (chosen ex-ante by residents, and known ex-ante by the developer before committing to the project).

Two main scenarios are considered, denote them fully-voluntary incorporation and semi-voluntary incorporation.

3.3.1 The easy case: voluntary incorporation

When incorporation is fully voluntary, residents unite to create a transactional vehicle governing both internal negotiations (between residents with differing preferences) and external negotiations (between residents as a group and the buyer–developer).

Internal negotiations are as to the value chosen for the preference coupon, where residents are expected to differ in their evaluation of the low-intensity usage, as well as in their attitudes toward risk. A large-value coupon reduces the probability of successfully enticing developers. Incorporation creates a vehicle for internal negotiations by relying on tried-and-tested voting procedures provided by corporate law as well as clearly articulated rules concerning minority rights and their protections.

External negotiations are between the residents and the buyer–developer (once the residents agree upon the preference coupon). Here, incorporation serves two main purposes: reducing transaction costs of negotiations and reducing enforcement costs. Reducing negotiation costs is achieved by creating a TIOLI scenario whereby the buyer–developer either invests or not, thus avoiding a protracted series of offers and counter-offers. Reducing enforcement costs is achieved by relying not only on contractual agreement (requiring court

intervention in case of a breach, and further enforcement of the resulting judgment), but on internal mechanisms of corporate control. Thus, by defining asset usage in the corporate bylaws, the buyer–developer is unable to deviate from the designated usage without managers’ approval. In case of a deviation (high-intensity usage without meeting the preference coupon’s terms), managers’ fiduciary duties and resulting fear of personal legal sanctions serve as a constraint on owners’ opportunism.

Allowing for multiple-level usages has another important advantage, namely the ability of the buyer–developer to insure himself against future developments. By purchasing the low-intensity usage, incorporation allows the buyer–developer to ensure the future option of switching to high-intensity usage at a known price (the preference coupon). This allows for revenue stream management, raising usage-level only if financially possible and when required under the circumstances. It also creates a non-revocable call option on the residents’ future agreement, thus eliminating any fear of opportunism by renegotiation. Indeed, without such assurances, after costs are sunk into the property residents might attempt to extract the developer’s surplus. This form of insurance is the essence of option-making, and ex-ante strengthens developers’ willingness to invest in the property, thus increasing competition for the asset and the residents’ (as well as overall) surplus.

Formally, voluntary incorporation can be summed up by observing the parties’ profit functions and stating their relevant incentives: Residents choose the amount of the preference coupon, y , taking into account that a large y simultaneously increases their profit if high-intensity usage is achieved and reduces the probability that such usage will be chosen by the buyer–developer. Residents’ choice of y is thus subject to countervailing forces. Denoting low-intensity usage as Π_{FL} and high-intensity usage as Π_{FH} , the buyer–developer (B) chooses high intensity if, and only if, his added profit exceeds the preference coupon. Low-intensity usage is essentially bought and paid for by the buyer–developer paying x for common stock, entitling him to firm control and initial profits. In case the buyer–developer wants to increase usage to high intensity, all added firm profits go to sellers, up to the amount of the preference coupon.

High-intensity usage is thus chosen if and only if:

$$\Pi_{FH} - x - y \geq \Pi_{FL} - x \quad \Leftrightarrow \quad \Pi_{FH} - \Pi_{FL} \geq y \quad [8]$$

which is the condition for efficiency of high-intensity usage, given that y is chosen to mirror the sellers’ subjective valuation of the externalities produced by increasing usage intensity.

Buyer and sellers' profit functions can thus be stated as:

$$\Pi_B = \begin{cases} \Pi_{FH} - x - y & \text{if } \Pi_{FH} - \Pi_{FL} \geq y \\ \Pi_{FL} - x & \text{otherwise} \end{cases} \quad [9]$$

$$\Pi_S = \begin{cases} x + y & \text{if } \Pi_{FH} - \Pi_{FL} \geq y \\ x & \text{otherwise} \end{cases} \quad [10]$$

Choice of y thus depends on the extent to which $\Pi_{FH} - \Pi_{FL} > y$. In the deterministic case, as long as the additional profits of the firm from switching from low- to high-intensity use exceed the preference coupon, the buyer-developer will be glad to pay for this option. The residents are thus able to extract almost all surplus.

In the more realistic case in which added firm profits are uncertain, residents have to consider the risk that the buyer-developer takes, as well as his need to expect ex-post strictly positive profits as incentives for ex-ante investments. The residents' choice of the preference coupon is thus constrained, as an attempt to extract all the surplus will cause the buyer-developer to keep usage-level low, thus reducing their gains.

The preference coupon y is bounded below as well – by the residents' value of retaining low usage of the entitlement. This may impede development, but not efficiency. Insofar as high-intensity usage harms the residents, it should be subject to the constraint of having the added benefit exceed the added harm. Thus, y serves as a vehicle for limiting development to the efficient cases. Residents can never be forced to divest their property: under certain circumstances, a choice of “no, thanks” can be the most appropriate one.

3.3.2 Semi-voluntary incorporation: property and liability intertwined

Semi-voluntary incorporation refers to cases where residents are forced to relinquish control of low-intensity usage (such as when building low-rise office space is within the buyer-developer's rights, even without the residents' approval). High-intensity usage is assumed to be prohibited absent residential approval. One example would be when the residents attempt to block the development of adjoining properties, only to meet with court approval of development per se, while limiting it to low-intensity usage. The court might then suggest, or force, the Incorporation Rule protocol to facilitate a beneficial transaction as to high-intensity usage as well. In this highly-realistic scenario, the court affords liability rule protection to the residents' interest in non-usage while simultaneously affording property rule protection to their interest in preventing high-intensity

usage. The protocol facilitates implementation by incorporating the entitlement and forcing upon the residents the x -for-low-usage exchange, while allowing them to determine the y -for-high-usage exchange. The residents may set a large y amount, preventing high-intensity usage altogether, or set a y amount subject to the constraints set out above. Whatever amount the residents set for y as the preference coupon, the buyer–developer retains the common stock in exchange for an x determined by a court, allowing him low-intensity usage.

Semi-voluntary incorporation thus combines the involuntary nature of a liability rule with the voluntary nature of property rule protection. By mandating incorporation along these lines, a court creates a vehicle for reducing transaction costs and facilitating negotiation, while avoiding any harm to the residents' property interests. Incorporation thus allows for differentiating between uses subject to different levels of protection, while streamlining (but not forcing) additional transactions. The mathematical formulation developed above for voluntary incorporation applies to semi-voluntary incorporation as well, with the only difference being that x is chosen by the court rather than the sellers.

Another way of combining a liability rule with a property rule is along the dimension of time, as in Bell and Parchomovsky's *Pliability Rules*.²⁶ The authors consider the cases in which property interests are transformed to liability due to changes in the way the asset is used (e.g. adverse possession) or due to external circumstances (e.g. essential facilities). Our Incorporation Rule protocol can easily accommodate such a pliability scheme as well. A court foreseeing a property rule/liability rule transformation over time can set the appropriate level of protection for each interest. The court can do so by positing suitable bylaws determining types of asset usage and accrual of profits thereof. Assigning control of a certain characteristic to the preferred-shareholders essentially grants them property rule protection, as they determine the price at which they agree to be bought out. Entitlement usage assigned to common shares, on the other hand, grants the sellers liability rule protection only, as the court determines the x at which they will be compensated. Future uses can be allocated along similar lines, as long as they can be delineated in sufficient specificity within the corporate bylaws. Uncertain uses are essentially assigned to common-stockholders, the buyer in our formulation, as these are the residual decision-makers as to firm property.

More generally, our proposed mechanism can be adapted to protect entitlements exhibiting mixed property rule/liability rule components in the following manner:

²⁶ Bell and Parchomovsky (2002).

- (1) **Property/liability:** Seller determination of x (common-stock price), with court determination of y (preferred-share coupon) creates a liability rule – that is, property rule protection for the basic usage with liability rule protection of add-on uses. Examples include sale of lock-in products, where the initial purchase can only be consensual and accomplished following bilateral negotiations, but add-ons equip the seller with monopolistic power. In cases such as these, courts may choose to constrain monopolistic pricing in add-on products or force the sellers to continue provision to locked-in consumers subject to certain terms.²⁷
- (2) **Property:** Seller determination of both x and y maintains a property rule protection for both types of uses, while dividing the contract into an exercisable component (x) and a call option. Specifying the option ex-ante adds to the buyer's ability to plan and avoid future "hostage" situations (hold-ups) where he is subject to monopolistic pricing once costs are sunk in the initial use.²⁸ Examples include utilities contracts whereby a local authority contracts for the construction of power lines, setting in advance the exercise price for future services or extensions of the basic grid.
- (3) **Liability/property:** The court determines x and the seller determines y . Such an arrangement entails a liability rule protection for the basic entitlement and a property rule protection for add-on uses. This follows the guiding example above, where residents are unable to block development, but can determine its extent.
- (4) **Liability:** The court determines both x and y , therefore ordering a liability rule protection for both components, while separating them into current (certain) uses and future (optional) ones. Such protection is appropriate when the buyer wishes to immediately engage in a low-intensity usage of the entitlement and requires protection from future opportunism on part of the sellers as to the add-on component, though the buyer's need for it is currently uncertain. Knowing in advance the price to be paid for an extension of use is valuable both in order to avoid hold-ups and in order to plan appropriately. Examples include cases where the buyer's usage harms sellers in a way requiring compensation, and the buyer needs to invest

²⁷ For example, the "Fair, Reasonable, and Non-discriminatory" terms common to standard-setting organizations. Courts dealing with add-on pricing and granting competitors access to essential facilities impose similar constraints, see, e.g. *Eastman Kodak Co. v. Image Technical Services, Inc.* (Kodak), 504 U.S. 451 (1992); *Aspen Skiing Co. v. Aspen Highlands Skiing Corp.*, 472 U.S. 585 (1985).

²⁸ See, e.g. *Williamson* (1983).

sunk costs in order to begin development. Separating the investment of such costs into two (or more) phases allows for mitigation of risk and lowering start-up costs. Such a result is important when continued use depends on initial success and resulting revenue will finance the extended option.

Of course, all of these combinations may be employed for simultaneous or consecutive uses. Thus, the *Pliability Rule* highlighted by Bell and Parchomovsky fits the second formulation above (while a *Loperty Rule* fits the third),²⁹ though they focus on time-varying protection of entitlements. Our Incorporation Rule mechanism allows for time-varying protection as well, but also for simultaneous varying protection granted to different aspects of the entitlement, involving usage restrictions such as height, noise, or more generally, any high-intensity restrictions. The Incorporation Rule protocol also allows for any other combination of liability rule and property rule protections, regarding any particular features of the entitlement in question.

3.4 Choosing the appropriate preference coupon

The sellers must choose an amount y , at which to set the preference coupon. In determining an optimal amount, sellers take into consideration both their preference for maximizing the amount of y and the effect that this amount will have on the buyer's willingness to pay it. As y increases, potential buyers will be less likely to accept what is essentially an offer to purchase the high-usage option, leading the sellers to be less likely to attain their stated remuneration. Having y both increasing the sellers' surplus and reducing the likelihood of obtaining it is precisely the double-edged knife driving truthful valuations in buy-me-buy-you deals of the sort dominating the options literature.³⁰ Similar to the famous "you cut, I choose" dynamic, y is subject to pressures from both above and below, leading the sellers to seek an optimal point in between.

Above, eq. [10] described the sellers' profit as:

$$\Pi_S = \begin{cases} x + y & \text{if } \Pi_{FH} - \Pi_{FL} > y \\ x & \text{otherwise} \end{cases}$$

where Π_{FH} denotes firm profit in the high-intensity usage and Π_{FL} denotes firm profit from low-intensity usage. This assumed that the buyer accepted the

²⁹ See Bell and Parchomovsky (2002:53).

³⁰ See the discussion in Section 2, *supra*, following reference to Footnote 14.

sellers' offer of y . Endogenizing the choice of y and focusing on the sellers' choice ex-ante, eq. [10] thus transforms to

$$E[\Pi_S] = f(y)[x + y] + (1 - f(y))x = x + yf(y) \quad [11]$$

where $f(y)$ is the perceived probability, y will be accepted by the buyer, and profitable high-intensity usage will ensue (these are separate events, but from an ex-ante perspective, these can be combined with no loss of generality). Since y is a transfer from buyer to sellers, the probability of its acceptance generally declines as the coupon increases, thus $f'(y) < 0$ over a significant portion of its support.³¹

The buyer's expected profit under the same condition is thus:

$$E[\Pi_B] = f(y)[\Pi_{FH} - x - y] + (1 - f(y))[\Pi_{FL} - x] \quad [12]$$

The uses to which the asset *can* be put are assumed to be known to the buyer and the sellers ex-ante, independently of their choices regarding x and y . The probability of *attaining* each usage, on the other hand, depends on the sellers' choice of y . Thus potential *firm* profits under low- and high-intensity usages (Π_{FL} and Π_{FH} , respectively) are determined exogenously, while *players'* profits depend on y , as the above equations show.

The sellers' choice is thus to maximize expected profits by choice of y :

$$\frac{\partial E[\Pi_S]}{\partial y} = f(y) + yf'(y) = 0 \quad [13]$$

The precise answer as to choice of y obviously depends on the case-specific probability function assumed and the sellers' attitude toward risk. In general, we can state that y will be chosen above the sellers' minimal truthful valuation (in order to extract surplus) and below the buyer's perceived reservation price.³² Under complete information (regarding firm's expected profitability), $f(y)$ will always equal 0 or 1. Zero when high-intensity usage is unavailable or inefficient (when costs of increasing usage outweigh expected profits), and one when the firm profits from high-intensity usage are deterministic or the sellers correctly

³¹ Taking into account that above a threshold depending on specific functional forms $f(y) = 0$ (deeming the coupon overpriced) and below other thresholds $f(y) = 1$.

³² When wishing to focus on protection of sellers' property interests, we might separate between sellers' valuation of the non-economic harm suffered by high-intensity usage and their profit motive. Such a formulation would be: $E[\Pi_S] = x + (y - y_{TRUE}) \bullet f(y - y_{TRUE})$ where sellers maximize their expected profit only as to the premium above the minimal necessary compensation for suffering such harm. Qualitative results of both formulations are similar, thus we concentrate on the more general case.

predict the buyer's valuation and price y accordingly, extracting all profits (Proposition 1).

Beyond issues of seller–buyer distribution, it is important to note that any preference the sellers' have for high- vs low-intensity usage is accommodated by the proposed mechanism. Sellers wishing to forgo the financial opportunity of high-intensity usage and maintain the quality of life associated with their current position are welcome to state a large (even infinite) y . Sellers wary of development, but still willing to sell their right to peace-and-quiet if the price is right, are also afforded such an opportunity.

Essentially, the financially motivated choice of y is subject to the constraint that y be above the harm suffered by residents from high-intensity usage. Then, the difference between the seller's harm and the buyer's benefit creates the surplus to be shared by them. In what manner this surplus is shared depends on case-specific valuations and risk-preferences of both sides to the contract. The sellers take a risk of losing the deal if they overreach, while the buyer takes the risk of committing to an amount that future usage of the asset may not generate. The benefit of incorporation here is that corporate mechanisms allow not just for the deal to be struck, but for *revenue streams of future usage to be committed to paying off the sellers* before the buyer may extract his own share. The sellers thus benefit from lower-cost monitoring and enforcement, while the buyer benefits from risking only future profits from asset usage, and not his own funds. Both share the incentive to make future asset usage profitable in order that their aims be achieved, thus cooperation and efficiency are maximized.

Of course, a mistaken choice of y can lead to sub-optimal results, but this is a general problem in contracting. It is important to note that the Incorporation Rule presented here does nothing to exacerbate such issues, and much to alleviate them, as both contracting and enforcement costs are reduced. As the propositions below show, incomplete information can be problematic under the Incorporation Rule as well, though this is a general issue under mechanism design rather than a result of the protocol used. As explained above, the Incorporation Rule protocol assists coordination and planning for unknown events. Compared to contracting, we offer an improvement, rather than a complete solution.

Transaction costs reduce social welfare and should be compared to realistic alternatives, namely the transaction costs of bargaining without the incorporation protocol. When eq. [1] is not satisfied (e.g. due to high administrative costs of incorporation), the protocol should not be used. However, it seems that in most cases where stakes are high, the costs of incorporation (which are mostly fixed) will pale in comparison with those of contracting.

Under these conditions, we can thus show that whenever transactions costs of incorporation are low (relative to realistic alternatives), the protocol is efficient, and under full information sellers can extract all benefits by pricing the preference coupon at precisely the difference in profits between potential uses of the entitlement.

Proposition 1

Under full information, seller chooses y to extract all profits from high-intensity usage.

Proof:

Recall from eq. [10] that

$$\Pi_S = x + y \quad \text{if} \quad \Pi_{FH} - \Pi_{FL} \geq y$$

Seller thus chooses y to maximize returns subject to buyer choosing high-intensity usage:

$$\max_y \Pi_S \quad \text{s.t.} \quad \Pi_{FH} - x - y \geq \Pi_{FL} - x \Leftrightarrow \Pi_{FH} - \Pi_{FL} \geq y$$

$$\Pi_S^* = x + y^* = x + \Pi_{FH} - \Pi_{FL} \Rightarrow \quad y^* = \Pi_{FH} - \Pi_{FL} \quad \blacksquare$$

Proposition 2

Under incomplete information, inefficient low-intensity usage might occur.

Proof:

Let $\Pi_F(\mathbf{Z})$ be true firm profits, depending on exogenous real-world factors (\mathbf{Z} as vector of relevant industrial variables). Thus the discrete, full information, case above had $\Pi_F(\mathbf{Z}) \in \{\Pi_{FL}, \Pi_{FH}\}$

$\forall \mathbf{Z}$ s.t. $E[\Pi_F(\mathbf{Z})] > x + y$ buyer accepts y and induces high-intensity usage.

$\forall \mathbf{Z}$ s.t. $x < E[\Pi_F(\mathbf{Z})] < x + y$ buyer accepts x and induces low-intensity usage.

Thus whenever $E_S[\Pi_F(\mathbf{Z})] > x + y > E_B[\Pi_F(\mathbf{Z})] > x$ sellers expect firm profits to justify a preference coupon higher than that which will cause buyer to induce high-intensity usage.

Buyer will thus choose low-intensity usage to obtain:

$$\Pi_B = \Pi_{FL} - x > \Pi_{FH} - x - y \quad \blacksquare$$

As these propositions show, under complete information the protocol is efficient, with all benefits from the transaction going to the sellers. This stems

from the fact that sellers were endowed with a first-mover advantage in stating the TIOLI offer. Realistic implementations are not likely to reproduce such a result, as information is likely to be incomplete and estimations biased. Potential inefficiencies stem from two main sources: strategic behavior under information asymmetry and transaction costs of incorporation. The first leads to a high valuation of the preference coupon, potentially leading the buyer to refuse to move the entitlement to the high-usage mode. The second, on the other hand, is a general attribute and may be considered a problem only when compared to realistic alternatives, namely the transaction costs of contracting. Eq. [1] sets out this comparison, and the reasons elaborated in the associated text outline why incorporation is likely to be cheaper than alternative modes of contracting available to the parties.

Optimally, y would be set at $E_B[\Pi_F(\mathbf{Z})] - x$, to extract the buyer's profit while not impeding high-intensity usage, though this demands sellers knowing the buyer's valuation of firm profits. Potential inefficiency thus stems not from the protocol, but from incomplete information, which is problematic regardless of the method of contracting used.

Obviously, y could be modeled as a vector of prices rather than one monetary choice. Thus, if the entitlement in question has multiple uses that the parties foresee (even future uses currently unknown), the sellers could create a menu of prices $\mathbf{Y} = (y_1, y_2, \dots, y_N)$. Incorporation then allows for multiple types of preference shares to be issued, each with its own coupon and conditions (this will be especially useful in situation of menus of options, as discussed in Section 4). Corporate bylaws can stipulate multiple uses requiring different authorizations and appropriating the revenue stream flowing from each type of activity to separate accounts to be distributed as dividends to the holders of the relevant preferred shares. Where future usage is uncertain, the parties can stipulate the conditions under which decisions are made, essentially dividing between them the role of the residual decision-maker.

4 Discussion and evaluation

4.1 Incorporation and contracting compared

The Incorporation Rule protocol can be mandated by the state, for example, instead of taking in eminent domain the entitlements of the residents in Case I.

³³ See, e.g. Easterbrook and Fischel (1991:15).

Basically, however, incorporation is no more than a specific type of contract, relying on default rules provided by the state.³³ Still, there are several features unique to incorporation that make the Incorporation Rule protocol distinctively advantageous to the parties involved, to the courts making use of it, and even to society in general.

To begin with, protecting an entitlement with an Incorporation Rule enables combining property rule protection and liability rule protection while using tried-and-tested corporate tools. Corporations are in a sense standard form contracts that courts are relatively experienced with. Parties can rely on the accumulated experience of many, reducing transactions costs and uncertainty. For example, preferred shares and the relationships between different types of shareholders are well carved out by existing corporate scholarship, while still allowing free reign as to case-specific adaptation. Corporate management can be vested in the hands of experts, utilizing the separation between ownership and control. Thus, the buyer and the sellers may contract out the entitlement usage itself while retaining profits and monitoring corporate officers. Corporate officers are subject to fiduciary duties owed to the firm itself, thus monitoring costs are borne by the firm and reduced by direct monitoring of the relevant shareholders who may demand information regarding the entitlement and may turn to the courts for enforcement. Enforcement costs are reduced both by the personal nature of fiduciary duties owed by managers (suppressing their willingness to breach) and by the positive externalities associated with the existence of a body of corporate law upon which injured parties may rely. Having corporate bylaws specify the types of use to which the entitlement may be put, and to whom the resulting income then accrues, creates a strict framework in which managers must operate. The result is that enforcement costs associated with an Incorporation Rule are occasionally expected to be lower, and certainty of performance higher, than if a similar framework were to be created contractually, without the tool of incorporation.

Second, and perhaps even more importantly, an Incorporation Rule can be employed in nonconsensual contexts where a contractual arrangement is not possible. Consider, for example, *case I* discussed in Section 1. Suppose the social planner is interested in accounting for the welfare of third parties (other than the resident–sellers and the developer–buyer) as well as for the welfare of the direct parties to the trade. For example, suppose the social planner is interested in allowing various interest groups to be able to influence the end result – either low-intensity usage of the open field or high-intensity usage, which includes massive development. A contract with potential interest groups is impossible, of course, as the social planner cannot predict in advance which group would be interested in becoming involved, and to what extent. However, an Incorporation Rule can bring about the result of accounting for third-parties' interests. Once

the corporate vehicle has been formed, the relevant securities issued, and even before the necessary coupons announced (x and y), the possibility of preferred shareholders – the sellers – trading their entitlements becomes feasible (and is to be permitted or not, according to the social planner's decision). If trading is in fact permitted, then under the Incorporation Rule protocol, the preferred shareholders may sell their shares to various interest groups, who would pay in order to be able to have a say on the amount of y , prior to it being announced as the preference coupon. Allowing “dollars-for-votes” facilitates high-valuation users buying out the low-valuation ones, creating a market for control of the entitlement. Resident-sellers might find themselves selling to environmental groups paying for non-development or to entrepreneurs paying to do precisely that. The state might even determine that it has an interest in the development. In that case it could buy out the residents itself in an eminent domain taking, or assist semi-privatized public interest groups by subsidizing the purchase of such coupons. This could be done directly, paying cash, or indirectly, such as making such purchases tax-exempt. It could also determine that particular cases are inappropriate for trade, as issues of incommensurability are raised. In such cases, the court mandating the Incorporation Rule would form non-negotiable preferred shares, allowing no outsiders to participate in the process.

4.2 Incorporation as option-making

The new Incorporation Rule mechanism can be best understood in the setting of a corporation, because securities issued by a corporation are a series of real options as to an uncertain value – the assets owned by the corporation, in various possible usages.³⁴ The exercise price of each option requires servicing all higher-ranking claims against the corporation. Creating a dual-class (more generally, multi-class) share structure allows for separating between the sellers' and the buyers' main concerns. Preferred shareholders are granted a contingent claim for a pre-determined lump-sum, combining their interest in maximizing corporate wealth (in order to receive a dividend in the amount of the preferred coupon), while limiting their involvement to defined usages of corporate assets. Incorporation thus facilitates separation of those interests defined to merit property rule protection, from those that merit liability rule protection.

³⁴ See Brealey et al. (2006:15–16), at 541 (characterizing various securities issued by a corporation as a set of options with regard to the corporation's assets); Bebchuk (1988) (characterizing each claim against a financially distressed firm as an option to receive the assets of the firm conditioned on payment of all higher-ranking claims and suggesting that corresponding options be issued to each claimholder in order to rearrange the capital structure of a financially distressed firm).

Legal entitlements can generally be described by the options they encompass, allowing for implementation of insights generated in the real options literature to environments well beyond financial markets.³⁵ For example, options serve the interest of eliciting truthful valuations from those holding them.³⁶ Consider a residential community contemplating methods of limiting negative externalities of a visual nature (e.g. the placement of plastic flamingos as lawn decorations). Rather than a fixed rule forbidding (or allowing) such externalities, it has been suggested to grant the residents call options through which they may purchase the right to make externality-producing use of their property, with the options priced according to community values. Creating a mechanism of call options, and even more so, redeemable call options, allows for eliciting truthful valuations from those exercising them (as they pay per use) and maximizing efficiency by allocating scarce resources to those valuing them the most.³⁷ Our proposed Incorporation Rule protocol in fact suggests a mechanism by which these ideas can be realized in practice.

Incorporation serves to facilitate menus of options, both put and call, as well as induce efficiency-enhancing trade. Preferred shares can be defined ex-ante as redeemable under certain conditions or at a pre-determined price, creating a menu of “callable call options”.³⁸ Furthermore, shares are generally tradable, as are preferred shares, unless specifically forbidden. Thus, exploiting the corporate mechanism not merely solves problems between the buyer and the sellers but helps the sellers arrive at a common valuation as well, essentially creating an individual ESSMO with regard to the buy/hold/sell decision and a communal ESSMO in the resulting choice of a preference coupon.

Corporate law routinely deals with coordination problems between multiple owners, usually pointing to a majority vote (pro rata) as the dominant mechanism. When multiple sellers commonly own an asset, anti-commons problems may ensue. For example, as in *case I* described in Section 1, residents must jointly reach an agreement as to the appropriate price for each type of usage. Differing preferences, as well as varying wealth effects and attitudes toward risk, complicate matters even further. The majority vote is assumed to allow for aggregation of preferences, although even then residents with especially strong preferences, or extreme views, may be disproportionately harmed.

The corporate mechanism allows for solving these problems through trade. Prior to deciding the amount of the preference coupon *y*, residents can trade among

³⁵ See, for example, the authorities cited in Footnote 14.

³⁶ See Fennell (2005:1466).

³⁷ Fennell (2005:1407).

³⁸ Fennell (2005:1466).

themselves so that those wishing to cash out early would sell their shares to those wishing to set a large preference coupon y . Residents willing to risk non-usage of the entitlement (or even wishing for it) would pay for their preference with cash, allowing those seeking monetary gain to achieve their purpose.

5 Conclusion

Legal technology may generate amazing results. Three basic, synthetic tools – corporate capital structure, separation of ownership and control, and the separate legal personality of a corporation – can reduce transaction costs, streamline the protection and trade of entitlements, and encourage the owner of an entitlement to tell the truth even when he would prefer to conceal it. Incorporation certainly “rules”, at least in some cases.

The article proposed a novel protocol for protecting alienable entitlements. Building on the extensive work of Calabresi and Melamed and those who followed in their path, we employed a series of options with an exercise price set by the forgoing owner of the entitlement. The result is an entitlement owned along the contours of a capital structure – divided between an inferior owner with a fixed claim (or a series of claims) and a superior owner with residual interests. Separating the entitlement into different facets meriting various levels of protection allows for flexibility in implementation as well as employing self-made options to elicit truthful valuations and reduce transaction costs. Entitlement usage can thus be separated along lines of conflicting rights in a way facilitating both efficiency in usage and fairness in protection of property interests. Employing tried-and-tested corporate mechanisms further allows for the delay of payment until income is generated, reducing risk and alleviating liquidity problems.

Of course, Incorporation Rules are far from perfect and are not always applicable. They create a tradeoff between the costs of contractual bargaining and enforcement on the one hand and agency costs deriving from employing the corporate form on the other. Such a tradeoff is context-dependent and specific circumstances must be addressed before implementation is sought. Still, by producing a real-world mechanism putting into practice theoretical ideals as to option making in law and varying protection of legal entitlements, the Incorporation Rule offers a substantial step forward.

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