

The Externality of Exchange

Benito Arruñada*

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Abstract

Property is defined by interaction among multiple exchanges which cause exchange-related non-contractible externalities. When such exchange-related externalities are considered, property becomes dependent on public and legal interventions. Regardless of their efficiency, two elements of public ordering (additional mandatory rules and a wider scope of impartiality) are necessary to contain the externalities otherwise produced under private ordering, and to reach true property enforcement and the associated advantage of truly impersonal—that is, asset-based—exchange. Building upon the Coasean framework, the paper develops this argument and uses it to clarify controversial policy choices in property titling and business formalization.

Keywords: property rights, externalities, enforcement, transaction costs, public ordering, private ordering, impersonal exchange.

JEL: D23, K11, K12, L85, G38, H41, O17, P48.

* Pompeu Fabra University and Barcelona GSE. E-mail: benito.arrunada@upf.edu. This work has greatly benefitted from exchanges with Yoram Barzel, Elodie A. Bertrand, Dean Lueck, Claude Ménard, Fernando Méndez, Marian W. Moszoro, Henry E. Smith, Oliver E. Williamson, and Giorgio Zanarone, and from comments made in presentations at UPF, Xiamen University and the 19th Annual Conference of ISNIE at Harvard University. Usual disclaimers apply. It received support from the Spanish Ministry of the Economy and Competitiveness through grant ECO2014-57131-R.

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1. Introduction

In “The Problem of Social Cost,” Coase (1960) considers a sample of cases in which firms harm each other (farmers and ranchers, railroads and farmers, a noisy confectioner and a quiet doctor). In its first pages, he argues that, assuming zero transaction costs, allocating rights to, for example, farmers or ranchers, would not affect the final use of resources, as both parties would negotiate and contract to arrive at the wealth-maximizing solution. The rest of the article focuses on the real situation to show that, when there are significant transaction costs, the initial allocation of rights may determine the final outcome. In addition to showing the reciprocal nature of the problem, it points out the essential function of legal institutions in implementing alternative public interventions by judges and governments, and in reducing transaction costs to facilitate private exchange.

The analysis in Coase (1960) laid the foundations for a dual function for property institutions. Given that transaction costs make trade difficult, the law strives to reduce them (which requires, for instance, “well-defined” property rights). Also, to the extent that transaction costs may impede trade, property law allocates rights in a way that maximizes value, making trade unnecessary (for example, by collocating certain sets of rights together, therefore avoiding any need to negotiate them). However, despite the pervasive influence of Coase (1960) in legal, economic and institutional analyses, it has arguably failed to achieve a substantial impact on property law and, more generally, on the analysis of property institutions. As recognized by Lueck and Miceli, “The economic analysis of property law is substantially less well developed than the economic analysis of contract law or tort law.... and much of the economics of property rights literature remains ignorant of property law” (2007:187). The reason for this divide is that “The Problem of Social Cost” relies on a simplified and partly implicit conception of property, which is effective for its original aims, those of showing the inconsistencies of what was at the time the prevalent analysis of externalities and the weaknesses of its policy prescriptions, and proposing instead a new theoretical perspective. It is, however, inadequate for understanding property institutions and enlightening policy on them.

This paper argues that the limited influence of Coase (1960) on property institutions is a consequence of maintaining its interlocked assumptions of single independent exchanges (i.e., no effects take place between transactions on the same asset type or even the same asset) and perfect information on the allocation of rights. These assumptions are useful for the analysis of *use-related* externalities (those arising from using assets), but disregard *exchange-related* externalities (those arising from trading property rights on assets), which are of the essence in the core problem in property markets: not the two-party conflict between sellers and buyers but the three-party conflict between, for example, sellers, buyers and owners. Moreover, solving use externalities by exchanging entitlements to them causes exchange-related externalities that require a different type of public intervention.

Coase's followers have taken his perspective to new areas but kept his assumptions, disregarding that, while they are suitable for analyzing use-related externalities, the latter are relatively marginal to the core problem of property institutions. This has even prevented some Coase-inspired works from taking a property perspective: despite its property label and worthy achievements, much of the economics of "property" rights in fact deals only with contracts and not with property. Consequently, misconceptions tend to arise regarding the role and relative importance of property institutions. In particular, "The Problem of Social Cost" relies on an ambiguous assumption about availability of information on property rights which tends to minimize and obscure the role that public institutions play in, first, defining and enforcing property rights, and, second, by reducing transaction costs, enabling impersonal markets. As summarized by Coase, "if market transactions were costless, all that matters (questions of equity apart) is that *the rights of the various parties should be well-defined* and the results of legal actions easy to forecast. But as we have seen, the situation is quite different" (Coase 1960:19, emphasis added).

Coase's statement left open what constitutes or determines a good "definition" of rights. This was a sensible methodological option for Coase's purposes. However, it has led most of the literature to focus the role of the state on the allocation of rights before any exchange takes

place,¹ disregarding that in an ongoing situation the quality of such a definition of rights is also affected by private exchange, and that some form of public intervention is needed to ensure a clear reallocation of rights after each transaction. Without such repeated public intervention, private contracting of property increases future transaction costs for third parties. And current transaction costs are also affected by previous contracting on the same type of asset and—most obviously—on the same asset, such contracting referring not only to transfers and divisions of assets and entitlements but also to delegation of authority to transact. The more private (that is, the more “secret” or the less “public”) the transactions, the lesser their verifiability for third parties and the greater the future transaction costs of entitlements and assets, as acquirers of rights on such type of asset would find it difficult to know who holds which rights and how each right is held, this being the key determinant of enforceability and therefore economic value.

As a result, the analysis of property rights ended up focusing on enforcement problems linked to state action at both the wider institutional level (following the pioneer works by, among many others, North and Thomas 1973, North 1981 and Olson 1993) and at the property market level (for instance, Epstein 1985), but disregarding the equally prevalent enforcement difficulties related to private action that are behind most of property law. Much of the literature worries about the state failing to make property secure or even becoming predatory, a reasonable concern

¹ Clear initial allocation of property rights is undeniably important. Libecap and Lueck (2011) provide interesting evidence on its effect by comparing two types of land that were allocated to US settlers at the end of the 18th century: in the Virginia Military District (VMD), settlers were given a right to appropriate a certain area, which was freely chosen by each settler, privately surveyed and recorded, without any purging procedure to avoid overlaps or clear the title; conversely, in the neighboring areas of Ohio, settlers were granted specific parcels, with a guarantee that there were no overlaps or conflicting claims and based on a rectangular survey for physical demarcation. They find substantial and persistent differences between these two types of land, not only in terms of land value, but also in roads, number of transactions, and legal disputes, with the VMD understandably showing worse results. However, the importance of initial allocation should not obscure that of recurrent allocation, as illustrated by the story of the Kowloon Walled City, analyzed by Lai (2015).

considering the prevalent abuse of private property by the powerful in less-developed economies and the creeping expansion of statism that has taken place in developed economies, mainly through uncompensated regulatory takings. However, the economic literature pays little attention to the expropriatory phenomena that take place between private parties through market exchange and, especially, the opportunity benefits of state action—that is, the “private takings” that are avoided by the functioning of *public* property institutions, and the importance of such state action for enabling impersonal market exchange. (As explained in detail below, I use the term “state” in a broad sense, as public ordering.)² Many of these analyses therefore help little in understanding the role that the state plays in making real markets viable, departing from the approach that Coase himself advocated, based on comparing the actual costs “involved in operating the various social arrangements (whether it be the working of a market or of a government department)” (Coase 1960:44).

Following this Coasean approach, the rest of the paper reexamines Coase’s assumptions on property and, in particular, his focus on single transactions between two parties (Section 2). It then examines the role of public and private ordering in a context of property understood as sequential exchange with interactions between transactions. Public ordering is analyzed in Section 3, arguing that additional mandatory rules and a wider scope of impartiality are necessary elements in property; while private ordering is tackled in Section 4, illustrating its limits by exploring a variety of cases with varying success, and arguing for a symbiotic or hybrid organization of both public and private ordering. With this hybrid perspective in mind, Section 5 examines a variety of policy failures in property titling and business formalization, rooted in three theoretical attitudes closely linked to applying, out of context, the original Coasean focus on single exchange. These are: emphasizing the initial allocation of property rights, paying scant attention to legal rights, and overestimating the power of private ordering (Section 5). Section 6 concludes with a short summary.

² Moreover, it focuses on the relatively less important area of theft (see, for all, Schwartz and Scott 2011), instead of non-criminal, contract-driven titling difficulties.

2. Coasean Assumptions on Property

When considering “The Problem of Social Cost” from a property standpoint, a striking feature is apparent and has been repeatedly identified as characteristic: given that Coase is interested in “harmful effects”—i.e., negative use externalities—, he focuses on asset uses instead of assets. Consequently, he does not deal with the exchange of property but of relatively minor—in a sense, derivative—“property rights” related to nuisances caused by some uses of assets between neighbors.³ These transactions on what, following Merrill and Smith (2001:385) and to avoid confusion with property, I will refer to as “entitlements”, take place in the sidelines of property markets themselves, which mostly deal with assets instead of asset uses. For example, trade on the right to pollute is a minor part of all the property trades made by either the polluting firm or its neighbors: “[t]he types of transactions emphasized by Coase—agreements between two neighbors to modify entitlements more efficiently to manage spillover effects—are relatively rare. Much more common are outright purchases, leases, licenses, and lending of all stripes and varieties” (Merrill and Smith 2011:S91).

His focus on specific uses leads Coase naturally to treat property as a bundle of rights: “We may speak of a person owning land and using it as a factor of production but what the landowner in fact possesses is the right to carry out a circumscribed list of actions” (Coase 1960:44). This bundle of rights perspective has been criticized most prominently by Merrill and Smith (2011:S89–S92) because, in addition to allegedly leading to excessive public ordering or statism, it fails to capture the right of exclusion, for them the distinctive feature of property; it conceives property as perfectly malleable by contract, disregarding information costs caused by private customization of property rights; and it makes reciprocity in externalities, one of the main results in Coase (1960), implausible. Accordingly, Merrill and Smith conclude that “Coase’s picture of property had a distorting influence and that, in certain respects, it may have impeded intellectual progress in developing our understanding of the institution of property” (2011:S89).

³ An exception to this lack of attention is Coase’s unified ownership solution (1960:16–17), which borrows from his previous work on “The Nature of the Firm” (1937) to propose trade in assets in order to avoid the difficulties of trading in entitlements, seemingly abandoning the bundle-of-rights perspective.

This criticism has been disputed from a variety of viewpoints (compare, for instance, Epstein 2011 and Baron 2014).⁴ What matters the most here is that it is doubtful that the contractual emphasis in Coasean analysis is a necessary consequence of the bundle of rights view: in principle, the rights in a bundle are not necessarily malleable. Less obvious than seeing property as a bundle of contractible rights but, as I will argue, more damaging for understanding property markets and institutions, is the fact that Coase (1960) and most of his followers consider only independent single transactions: they focus on cases of bilateral exchange (which are intrinsically contractual in nature), and assume as a starting point not only that parties have perfect information on the allocation of rights but—crucially—that this availability of information is not affected by private contracts on either property or entitlements.

This is clearly the case for Coasean exchanges in externalities, which in Coase (1960) are implicitly assumed not to be affected by other previous transactions, nor to affect the cost of subsequent transactions on the same asset or, more relevant for causing externalities, on other

⁴ Epstein even ventures to assert that “it is the unitary conception of property rights that is in fact vulnerable to creeping statism. Extol the vision of private property as one unitary thing, and the law will give strong protection against outright dispossession but little against regulation. That is the nub of the legal difficulties in takings law today, and it is driven not by a bundle-of-rights theory as such but by an eerie willingness to infer return benefits to an owner whose property has been taken, whether by occupation or restriction, when none exist, or to postulate huge externalities from ordinary harm. The vast over-estimation of return benefits guts the just compensation requirement. The vast over-estimation of negative externalities expands the police power beyond recognition. Use the bundle-of-rights theory to constrain both of these abuses, and the system of property rights will flourish with what is, after all, a conception of property that long antedates the Progressive Era and the modern New Deal state that it spawned” (Epstein 2011:233–34). In a different context, the notion of the bundle of rights was essential for Steven Cheung’s efforts in making the idea of property acceptable to the Chinese communist leaders, who were not prepared to allow ownership but would accept granting people a package of delineated use and sale rights. See, for instance, “Key Intellectuals: Steven N.S. Cheung,” Australian Centre on China in the World, <http://ow.ly/Nsgfu> (accessed July 20, 2015).

assets of the same type. In particular, it remains undefined which type of rights (i.e., either real, *in rem*, property rights valid against all individuals or personal, *in personam*, contract rights valid only against specific persons) are held by whom: when the transactor in one of Coase's examples is assumed to hold a right to pollute, it is undefined if he also has a right to sell such a right or to sell the corresponding asset, and, if he does sell the asset, it is also unclear who would be committed by the previous transaction on the right to pollute—the seller or the whole world, including asset buyers. Furthermore, these possibilities are implicitly supposed not to affect the transaction costs incurred to remedy externalities and these externality-remedial transactions are also supposed not to affect the transaction cost of trading assets.

Let us examine, for example, the Coasean case of the noisy confectioner and the quiet doctor. When the transacted entitlement is enforced *in personam* and whatever the parties intend to transfer, the confectioner *C* transfers to his neighbor Doctor *D* the right to harm *D* but in such a way that if the owner (*C* or somebody else) then sells his land to *B*, *B* will enjoy the right to harm *D*. The doctor acquiring the polluting entitlement is less protected, as he is subject to the additional risks of, for example, the owner selling the asset. This trading of *in personam* entitlements is therefore, on the one hand, a somehow less effective solution for contracting use externalities but, on the other hand, it does not affect the trade in assets.

Contrariwise, when the entitlement is enforced *in rem* and held by the confectioner *C*, *C* may transfer to *D* the right to harm neighbor *D* in such a way that if the owner of the land sells it to *B*, *B* will not enjoy the right to harm *D*. After purchasing the polluting entitlement from *C*, *D*'s land will therefore enjoy an additional *in rem* right. We then have the opposite effect of strengthening trade in entitlements, but trade in assets—in all land of that type—would suffer an added information asymmetry because asset buyers would have to respect the transferred entitlement even if the transaction on the entitlement had remained hidden. If they had bought the land free of such a burden, their only recourse would be a harder-to-enforce and therefore less valuable personal claim for indemnity against the seller.

At least as a first approximation, lacking in rem enforcement has a detrimental effect whose importance depends on the relative value of the entitlement and the other rights.⁵ For the type of use externalities that were of interest to Coase, it seems relatively inconsequential, justifying his assumption of single exchange and his disregard for contract interaction, sequential exchange and in rem enforcement. However, it is more damaging for major rights, and they require specific solutions to make it possible to enforce and trade in rem rights. (In addition, the reciprocity conclusion in Coase (1960) remains valid: whatever the differential effects of alternative initial allocations on transaction costs, these differences should not in principle be affected by having the rights enforced in rem or in personam.)

Moreover, Coase (1960) does not explicitly say if the entitlements under discussion are being allocated and contracted in rem or in personam. What he assumes is that both parties know who has such rights. But, in principle, when Coase (1960:19) prescribes that “the rights of the various parties should be well-defined,” he does not consider whether those rights will be enforced in rem or in personam, so that either the whole world or only one person, respectively, is obliged to respect them. One could therefore interpret that, under Coase’s assumption, rights would be well defined not only for the first transaction that internalizes the externality under analysis but also for ulterior transactions, even though, in principle, the first transaction might potentially obscure such a definition. Coase would therefore be assuming not only a transparent initial allocation of rights but also existence of the institutional mechanisms necessary to keep rights transparent after parties’ transactions.

Obviously, this interpretation is unnecessary in the world of Coase (1960) because his is a world of single exchange where obligations only exist between the transacting parties and their transaction does not affect third-parties’ rights or transaction costs. Assuming a single exchange implies that all effects take place between contracting parties. As other claimants simply do not

⁵ For Hansmann and Kraakman, not only use externalities but most “partial” rights are not enforced in rem: “Because the benefits of partial property rights are often low and the costs of verifying those rights are generally high, property law necessarily takes an unaccommodating approach to all but a few basic categories of partial property rights” (Hansmann and Kraakman 2002:S375).

exist, the only possibility is that the rights are granted to the parties to the transaction. Therefore, in this two-party world, rights in rem can only commit the transacting parties: all rights are in personam. This makes it possible to rely on purely contractual solutions, where the state is less necessary to enable transactions. Moreover, given that they have only inter-party consequences, they can also be personally safeguarded using private-ordering arrangements based on reputational assets and the expectation of future trade.

The only problem is that such a two-party world is a fiction, and considering sequential exchange and in rem rights brings drastic changes. Above all, a contradiction emerges between the assumption of perfect information on property rights and the free private contracting solution for externalities. The conclusion that, when rights are initially well defined and transaction costs are zero, parties contracting will produce the socially optimal allocation of entitlements no longer holds because such private contracting obscures the definition of rights—the allocation of entitlements—for all assets of the same type, a definition which was assumed to be clear. Therefore, freedom of contract may solve some misallocation of entitlements but will also cause negative externalities in terms of greater information asymmetry for future acquirers, not only in that specific asset—an effect that may be more easily internalized—but—essential for causing externalities—in all assets of the same type, given that all of them may be subject to similar burdens. That is, even if owners internalize the effect of their choices on their acquirers' responses and, consequently, on the value of the transacted asset, they will not internalize the effect on potential acquirers of all other assets and, therefore, on their value. Furthermore, non-contractual rightholders, who by definition are not in a position to choose, would remain unprotected by the parties' right to choose the contract verification and commitment mechanism.⁶

If uncontained, these exchange-related externalities will reduce the value of all similar assets for at least two reasons, related to lesser standardization of rights and greater information

⁶ The effect holds even if the specific effects hinge on the adjudication rule applied (either a “property” rule favoring original owners, or a “contract” or “liability” rule favoring buyers). See, among many, Baird and Jackson (1984), Arruñada (2012:34–41). Calabresi and Melamed (1972) pioneered a whole literature on contract and liability rules but in a single exchange framework.

asymmetry. First, when customized property rights are enforced in rem, the value of all assets may be reduced if acquirers incur greater costs for understanding the idiosyncrasies of what they are buying (Merrill and Smith 2000:31–32, Smith 2011:158–60). Second, and probably more important, granting in rem enforcement to hidden rights (for example, a hidden mortgage or, in the Coase [1960] scenario, a hidden entitlement to impede certain uses) decreases the market value of all assets which potential buyers might think may be encumbered with such hidden burdens.⁷ In both cases, as in Akerlof (1970), the externality comes about because the possibility of fancy rights or burdened assets reduces not only the value of the assets subject to such rights or burdens but also the value of any assets of the same type potentially subject to them. This reduction in value results from the increase in acquirers' information (Merrill and Smith 2000) and verification costs (Hansmann and Kraakman 2002); and, more generally, from the costs that owners and acquirers must incur to overcome the additional information asymmetry and to gather and formalize relevant consents (Arruñada 2003), as well as from the residual opportunity loss caused by the fall in the volume of transactions and the extent of specialization.

Exchange externalities are, however, prevalent, because in rem rights are inevitable, and the externalities they cause are hard to contain because private-ordering solutions (guarantees, repeated interaction, certification, information agencies, title insurance) are by themselves ineffective in the absence of some state intervention and, even when effective, end up producing at most in personam remedies. Reliance on rights in rem and in personam is not a matter of contract or institutional choice, but is a factual consequence of enforcement: adjudication of a certain type of conflict, which is of paramount importance in market transactions dealing with durable assets or the priority of rights and obligations,⁸ always consists of allocating remedies in

⁷ Positive hidden information (for example, a parcel of land enjoying a right of way over an adjacent plot) is not a relevant issue because, contrary to burdens, the seller has all possible incentives to disclose it to the buyer in order to achieve a higher price. More precisely: the seller of the first plot has more incentives to disclose than the seller of the adjacent, burdened, plot.

⁸ More precisely, assets (or priorities on assets) which are not only durable but also functionally identifiable and immovable. See an interesting counter-example in n. 20. Functionality in identification and mobility is key for corporate assets.

rem and in personam. Moreover, negative exchange externalities are often impossibly costly to contract by parties alone because they affect innumerable and unknown potential parties (for example, the above-mentioned owners of unburdened assets). Containing them therefore requires public-ordering institutions. I will now develop two aspects of this argument in greater detail.

3. The Minimum Elements of Public Ordering in Property: Additional Mandatory Rules and Wider Scope of Impartiality

The role of public or state ordering differs between single and sequential exchange in two main dimensions. First, the relative weight of default and mandatory rules in enabling each type of exchange, with corresponding changes in the relative importance of initial and recurrent allocation of property rights and the role of contract and property law. Second, the required scope of impartiality of third party enforcers and, in particular, judges and their suppliers of evidence, with consequences for the comparative advantage of private and public ordering and for the parties' freedom to choose enforcers. This section explains why sequential exchange requires additional mandatory rules and a wider scope for independence in enforcement.

3.1. Mandatory Rules, Allocation of Rights and the Interaction of Contract and Property Law

The role of the state emerging from the single-exchange analysis in Coase (1960) is given by the fact that, when transaction costs impede transactions, some sort of legal intervention might be needed to allocate asset uses to whichever party values them the most.⁹ However, this initial allocation is not mandatory and parties could abrogate it contractually. In principle, in the single-exchange, in personam enforcement world of Coase (1960), there is no justification for mandatory rules constraining parties' freedom to structure their rights: the only externalities arising are use externalities, and the transaction costs incurred to contract them are internalized

⁹ Compare, however, Priest (2014), who interprets that “the central theme of ‘The Problem of Social Cost’ is the radical view that governmental actions cannot importantly effect the allocation of resources in the society” (Priest 2014:144).

by the parties themselves. Under such an assumption of single exchange, it is understandable that property law is seen just as a starting point for contract law, a mere baseline for contract (Cheung 1970; Hermalin, Katz and Craswell 2007). Similarly, “economic” property rights tend to be seen as separable from “legal” rights (Alchian 1965, Barzel 1989).

Conversely, in sequential exchange, contract interaction causes exchange externalities which, as argued above, are hardly contractible because they affect strangers to the transaction, mainly owners of assets of the same type. In the interest of all market participants, and to enable impersonal transactions, containing these exchange externalities therefore requires some form of mandatory public-ordering intervention. This encompasses the choice of two sets of mandatory rules to either limit in rem enforcement to a closed number (*numerus clausus*) of rights in rem or subject in rem enforcement to conditions containing those exchange-related externalities.

The most simple solution is to make certain (usually minor) entitlements unenforceable in rem.¹⁰ This was often the case, for example, with leases under the Roman law rule “sale breaks hire”. This rule is mandatory and constrains private freedom of contract because it impedes parties from enforcing a lease in rem, granting the lessee an in rem right valid against the whole world. For instance, the lessee would have to relinquish the asset to the buyer when the lessor-owner violates their agreement and sells the asset. The lessee would only hold a personal claim against the seller, and—whatever parties contract—leases cannot be given in rem enforcement. More generally, not enforcing all other entitlements in rem is the solution implicitly chosen when in rem enforcement is based on possession: in the absence of additional conditions, all other claims (including ownership, as in the Uniform Commercial Code’s entrusting of possession solution [UCC §2–403[2]) are enforced in personam.

Alternatively, the rule has been modified in many jurisdictions so that the law enforces leases in rem when the lease is made public. This second solution can also be implemented in two ways, with different degrees of centralization. First, as is often now the case with residential

¹⁰ See Merrill and Smith (2000), Hansmann and Kraakman (2002), Arruñada (2003), as well as n. 5 above. Note that the *numerus clausus* refers to the division of interests in property; it therefore does not deny the above mentioned inevitability of in rem enforcement with respect to durable assets.

leases, by relying on exchange byproducts, such as the informational value of the exercise or delivery of possession (Arruñada 2015). Second, by developing dedicated organizations (that is, property and company registries) which, for each transaction, either produce qualified and publicly available judicial evidence, as the recorders of deeds found in France, Italy or the USA do, or publicly reallocate in rem rights, as the registries of rights of Australia, England or Germany do (Arruñada 2003).

Whatever its centralized or decentralized implementation, this solution explicitly clarifies the interaction and complementary role that property law plays with respect to contract law in four main aspects:

First, property law adds a public phase to private contracting by conditioning in rem enforcement to additional public requirements. Thus property, in rem, rights are only transacted in a two-step procedure which includes a first step corresponding to the conventional private contracting between the parties, with effects of an in personam nature; and a second, relatively “public,” step which is capable of granting universal in rem effects because public authorities represent all interested parties (Arruñada 2003).¹¹ This second step is *public* not because it usually involves state representatives, or because it is based on public knowledge, or even because it contains mandatory elements, but because it necessarily involves strangers to the intended transaction—relying on state representatives is just a means of providing impartiality. It is this presence of strangers to any of the single transactions that drives the need for additional impartiality and public ordering.

Second, for any given level of in rem enforcement, such public intervention is not an option but a necessary condition to enable private property contracting. For example, making land registries more or less active in their review of transactions (that is, having German or Torrens-type registration versus French or American recordation) alters the timing of the public interventions purging and allocating property rights. Recordation of deeds allows conveying parties more discretion on timing and heavier reliance on privately-produced information, so it seems to rely more on private decisions. However, this perception is deceptive, as recorded titles

¹¹ Notice that, from this perspective, the complementarity between contract and property runs deeper than the limitations on their substitutability sustained by Lee and Smith (2012:151–54).

retain greater in personam content than registered titles. Consider the set of available remedies: those provided by registration are only available under recordation after a judicial decision. Given the survival of conflicting claims in rem, this additional intervention by the court (a purge or quiet title suit) is required to transform such personal claims into real rights with an in rem quality equivalent to that provided by property registration for all registered transactions.¹² The extent of public intervention is determined by the target degree of in rem enforcement, and reaching a certain level of in rem enforcement requires the same degree of public intervention. (This is a mere technological feature that does not affect efficiency: the efficiency level and timing of in rem enforcement, which are not discussed here,¹³ are driven by many other factors—mainly, the existing opportunities for impersonal trade and the cost of alternative institutions for property titling.)

Third, without a mandatory rule requiring at least some type of publicity for in rem enforcement, producing or acquiring information is practically impossible for the parties and even for specialists. This is because it is not possible to produce information on contracts that parties themselves have an interest in keeping secret or in producing afterwards opportunistically.¹⁴ Take, for example, the case of a legal system in which mortgages could be

¹² Moreover, for any type of registry, public intervention is only of an enabling type: even if in Torrens-type registration, transactions are reviewed by registrars in a quasi-judicial capacity, they act as gatekeepers, with ultimate decisions being made by rightholders when giving their consent. Therefore, public intervention does not interfere but enables private contracting of in rem rights on property.

¹³ See Arruñada and Garoupa (2005) for the modern choice between titling systems; and Arruñada (forthcoming), for a historical analysis of the choice between privacy and public titling applied to classical Rome.

¹⁴ The problem lies in information asymmetry that usually takes the form of the seller knowing more than the buyer about previous transactions affecting the seller's rights and legal title. Mere lack of information in which both parties are equally ignorant would be easily handled by either parties' self-insurance (if they are neutral with respect to the specific risk) or their contracting with a third party a title insurance policy organized on a pure risk-pooling basis. (Most resources

enforced in rem even if they had remained hidden (as was common during the Ancient Regime). Not only was it practically impossible to produce information on existing secret mortgages but the risk remained that, if necessary, debtors could produce new mortgages with friendly partners, and conveniently backdate them to defeat their creditors.¹⁵ Moreover, owners could not commit to not cheat on creditors, so that they had to rely on granting ownership to them with the authority to sell if the debt was not paid, using contractual arrangements similar to the *fiducia* of classical Roman law. In such circumstances, specialists in producing information suffer an additional serious disadvantage and their operations therefore hinge on the existence of *public* rules and requirements for public access to information on the relevant contracts. Producing information therefore requires public intervention to change the applicable mandatory rule and,

in US title insurance today, instead of being spent on pooling risks, are spent on avoiding them, which is consistent with it mainly overcoming information asymmetries [Arruñada 2002]).

¹⁵ At the time, title was often evidenced only with a deed or contractual document signed by the parties and testified by solicitors or notaries. Two features are worth noting. First, formalizing the transaction in a written deed (as in the Statute of Frauds enacted in England in 1677) and witnessing by professionals are already public mandatory requirements, which places this solution in the public-ordering space. Second, this reliance on the chain of deeds was ineffective because it opened up possibilities for destruction, error and fraudulent conveyance. In medieval England, “the security of conveyances executed by feoffment accompanied by charter was a continuous source of worry to landowners, for both theft of charters and forgery of them were common” (Simpson 1986:121). Centuries later, the most egregious cases were perhaps those involving counter-deeds, well described for centuries in modern continental literature (for instance, Alemán 1604, Balzac 1830). And even without forgeries or fraud, the system often gave rise to multiple chains of title, which left prospective acquirers facing the risk that the title of the seller be defeated later by the title of an unknown claimant based on an alternative chain of deeds. To contract mortgages, they used to pledge the titles with the lender, a solution that poses similar difficulties and adds another risk for the mortgagor: the mortgagee could impede a future sale or even fraudulently sell.

in practice,¹⁶ condition in rem enforcement of mortgages to make them effectively public. Such intervention is not only public but mandatory: a default rule from which parties would be free to opt out would be ineffective.

Lastly, the sequential exchange perspective also clarifies the link between legal and economic property rights, with economic rights becoming a consequence of legal rights. From a single exchange perspective, it is even considered that economic rights enforced by private ordering are not legal: “Legal rights are the rights recognized and enforced, in part, by the government” (Barzel 1989:4), so that, more clearly, “[t]he rights delineated by a third party not using force are not legal rights” (Barzel 2002:180). Even in a context of single exchange, this non-legal nature of privately-enforced rights is uncertain on positive grounds, because private ordering hinges on judicial forbearance and comparative efficacy (Williamson 1991, Masten and Prüfer 2014). Nevertheless, it could at least theoretically be possible and even arguably optimal because the in personam, contractual, rights which are the object of single exchange can be enforced privately, as they are valid only between the transacting parties. However, this is not the case for the in rem, property, rights of any sequential exchange, which are necessarily enforced by “public” third parties—the state, for short—, as they are valid not only against parties to a single transaction but against the world—i.e., against parties to previous and future transactions—. Therefore, on both positive and normative grounds, when considering sequential exchange, economic rights are not separable from legal rights. Economists often imagine societies without legal institutions, but they are only composed of, let us say, pairs of Robinson Crusoes and Fridays, a useful simplification that must not be confused with reality.

¹⁶ It is worth recalling that mandatory registration was ineffective in different jurisdictions until the law switched—and judges effectively enforced—the priority rule for adjudication from the traditional “first in time, first in right” to the new “first to record, first in right”. See Rose (1988) and König (1974) for the experience in colonial USA, and Arruñada (2012:55) for other historical examples.

3.2. *The Structure of Information and the Role of the Third Party Enforcer*

In a common interpretation of Coase (1960), the role of the courts is seen as allocating uses to maximize value when contracting is not viable. More generally, in addition to ensuring contractual enforcement, the judge is also expected to fill the gaps in the contract, thus providing adaptation to unforeseen circumstances: “[a] dispute that brings parties to court implies that a contract did not delineate rights adequately, possibly because of changes in conditions after the contract was signed. The ensuing contract ruling then will explicitly delineate the parties’ rights” (Barzel 2002:169).

To perform this function, the judge must be impartial with respect to the parties. However, given that in this single-exchange setup the judge adjudicates between only two parties to a single contract, these two parties have not only the opportunity but also good incentives for choosing an impartial judge and, in general, designing an effective enforcement mechanism. This is why the judge could be replaced by private-ordering solutions based on the parties’ reputation and the expectation of future trade.¹⁷

This is not the case, however, in sequential exchange, which involves at least three parties entering two non-simultaneous contracts, so that one of the parties would not be represented in the other two’s choice of enforcement mechanism. Understandably, this unrepresented party would fear losing enforceability in rem—that is, she would have to rely on in personam rights against the other parties.

In particular, free choice of enforcer would worsen the defining conflict in sequential exchange, which relates to the legal rights of at least one of the transacting parties (for example, the seller). Such legal rights depend on a previous transaction with another party (for example, whether or not the owner has properly authorized the seller) and determine judicial decisions adjudicating the in rem and in personam remedies between two of the at least three parties (in the example, deciding if either the owner or the buyer gets the asset while the other gets instead a personal claim on the seller). The enforcer’s decision must be based on evidence about the

¹⁷ Many historians argue, however, that pure private ordering has been insufficient to enable markets to function even in the contractual field, claiming instead that effective public ordering is needed (Ogilvie and Carus 2014).

authorizing transaction and such evidence must be protected against opportunistic choice or manipulation by all parties, not only those involved in one of the transactions. (Imagine, for example, an owner claiming that she had not authorized the seller when the sale to a buying third party shows itself to be a bad deal.)

Consequently, by giving rise to in rem enforcement, sequential exchange poses an additional problem that requires a wider scope of impartiality than mere contractual enforcement of single exchange.¹⁸ The governance of in rem enforcers must ensure information and impartiality with respect to parties involved in all transactions: not only transacting parties in each single transaction but also all parties holding rights on the asset or potentially acquiring rights in assets of the same type. Such parties, being complete strangers to most of the intended single transactions, are not in a good position to choose or somehow incentivize the enforcer or those producing evidence that might be relevant for enforcement.¹⁹

4. The Scope for Effective Private Ordering in Property

Together with the additional mandatory rule establishing the requirements for in rem enforcement, this wider scope of impartiality defines the two minimum elements of public ordering that, whatever their costs, are necessary for enforcing in rem rights.²⁰ In essence, these

¹⁸ Note that in rem rights are meaningful only in sequential transactions: having a right against the world is the same as having a personal right against your contractual counterparty when the world is inhabited only by you and your counterparty.

¹⁹ Note that the circumstances of sequential exchange depart from those of repeated exchange commonly assumed in contract theory. The conventional distinction between one-shot and repeated transactions refers to the same parties (either directly or related through reputation) transacting different assets or services. Here, however, the repetition of interest comes from the fact that the exchange deals with property rights on the same asset, and the parties to two of the transactions are also (at least partly) different.

²⁰ Conversely, private ordering has an intrinsic advantage when rights are unenforceable in rem, as with assets that are “easily portable, universally valuable and virtually untraceable”, such as

two elements of public ordering cannot even be replicated by pure private ordering. Private ordering may play a role, however, in providing services for contractual verifiability. In particular, the need for these two elements does not mean that the government—narrowly defined—is the optimal provider of verifiability.²¹ Indeed, decentralized provision of verifiability by private market participants is always the case when judges adjudicate by relying on the publicly observable byproducts of private transactions (mainly, on the delivery or exercise of possession). And, when proper priority rules are clear, registry services can also be produced by a “private” entity in a position of impartiality with respect to all parties. A case in point is that of financial assets. Even if, to eliminate delays between settlement and registration, the best practice is for a single clearing agency and depository to act also as a register (BIS-IOSCO, 2001:13), as with the DTCC in the US, several registries are sometimes used in so-called indirect holding systems, with two-step registration: a central depository and multiple custodians. However, when these custodians also act as first level registers, they are chosen by the issuer of the securities, so transactors themselves have no choice. Furthermore, when the issuer switches register, he has to provide the consent of third parties (such as lien holders), in a process supervised by the central register. In addition, rights with more potential to cause conflict (for instance, second liens) are simply not enforced in rem. Lastly, the central register is the sole register with legal effects for all securities owned by entities with registration functions (Arruñada 2003:426). Therefore, this type of arrangement is “private” with respect to the running of the registry but, considering the above patterns, it is “public” with respect to its central features, this being a mandatory requirement usually defined in terms of priority rules and a lack of influence for any particular user.

diamonds, which explains why the diamond industry has been based on a “millennia-old distribution system that relied on multiple layers of personal exchange” (Richman 2009:32).

²¹ In fact, the record of governments in managing public registries is poor, from the Egyptian land registries of Roman times (Monson 2012:127–31) to administrative tracking of conservation easements in the USA today (Owley 2015). However, absolute performance is trivial here: what matters is the relative performance of public versus private ordering, and effectively combining them, as emphasized in Arruñada (2012:193–228).

The limitations of private ordering in property become clear when this hybrid type of financial registry is compared with the two prominent private registries built by the US property titling and mortgage industries: the title plants developed by title insurance companies, and the electronic registry of mortgage assignments created by mortgage lenders.²² Since the nineteenth century, title companies have kept private title plants that replicate public land records. That is, they transfer and abstract documents lodged at the public recording offices and build tract indexes so that the relevant information for each land parcel can be located more easily. This allows title insurers to improve the efficiency of title searches, discover any preexisting defect in the title and exclude it from coverage. At the end of the twentieth century, participants in the secondary mortgage market created the Mortgage Electronic Registration Systems (MERS) as a way of avoiding the costs and delays of local recordation of mortgage loan assignments by decoupling the local and national sides of the market. At the local level, MERS was to be the lender's representative, holding the rights in rem, enforced through the recording offices. At the national market level, MERS could also act as a registry of transactions for its members, keeping a record of de facto in personam rights held by lenders and investors in mortgage securities.²³

In the context of our discussion, the limitations of both of these solutions are clear: they produce at most in personam effects while it is the public recording offices that produce in rem effects. Understandably, both private arrangements also use the information in the recording offices as the basis for their activities. Thus, although title plants are well organized and heavily

²² Another private registry, for Internet domains, is analyzed along similar lines in Arruñada (2003:427).

²³ Crucially, MERS is owned and controlled by lenders, protecting them against the risk that MERS might use its stronger in rem position to defraud them, as an independent rightholder might otherwise be tempted to do. Considering that UCC Article 3 provides a “*mortgage* title-and-transfer system” (Levitin 2013:653, emphasis in the original) would suggest that the transferred rights are rights in rem. However, effects on third parties are in fact limited, as shown by the foreclosure crisis, partly as a result of reliance on the revised 2001 version of UCC Articles 1 and 9 (Levitin 2013:688–97).

regulated,²⁴ they only serve companies' internal administrative functions. The case of MERS is similar, especially after the foreclosure crisis showed that it faces difficulties for acting as a judicial representative of lenders (Levitin 2013).²⁵ When title insurance and MERS are compared to the privately-run registries for financial securities, it becomes clear why they do not produce legal effects: entry in title plants and MERS is voluntary and both are run by one of the parties to the transactions. They therefore lack independence.

The requirement of additional public ordering in terms of mandatory rules and impartiality does not preclude individuals from joining forces to develop self-governing, market-wide and independent third-party enforcers. The key element is that, when they do so, they are not acting as parties to any particular transaction. On the contrary: they are assuming that the third-party enforcer will be ruling on transactions in which they have not yet entered and for which they therefore have incentives to prefer efficiency-minded, independent enforcers. What they are doing would therefore, if anything, be better described as creating the rudiments of an

²⁴ The industry is subject to pricing regulations, entry barriers, and comprehensive rules on products and processes (Arruñada 2002, Eaton and Eaton 2007, GAO 2007). In particular, since it is heavily concentrated (ALTA 2015) and title plants enjoy decreasing unit costs (Lipshutz 1994:28), suppliers are good candidates for becoming natural monopolies so, understandably, their behavior has been repeatedly scrutinized by competition authorities. (See, for example, FTC 1999).

²⁵ In fact, the presence of MERS provided a ready excuse for borrowers to delay and often block foreclosure procedures by questioning MERS's standing: because MERS was not the mortgage holder, borrowers claimed that it had no right to foreclose and that, by acting as a representative for lenders, it made it difficult for borrowers to get in touch with lenders when seeking to renegotiate their loans individually, as well as to structure wide-scale modification programs. The abundance of cases in which judicial rulings against MERS were later overturned on appeal suggests that many local courts likely took a narrow legalistic position against MERS in order to protect local borrowers (for instance, Korngold 2009:743). It illustrates, however, how damaging a lack of independence in fact or in appearance is for those aiming to provide judicial evidence in this area (Arruñada 2012:74–75).

independent market-enabling proto-state, a description that is applicable to many accounts of allegedly private-ordering solutions, including those relating to the Californian gold rush (Umbeck 1977), medieval Jewish Maghribi traders (Greif 1989, 1993), the medieval law merchant (Benson 1989), medieval fairs (Milgrom, North and Weingast 1990), self-governing property arrangements (Ostrom 1990), the cotton industry (Bernstein 2001), the US West (Anderson and Hill 2004), or even anarchist solutions for land titling (Murtazashvili and Murtazashvili 2015).²⁶ Interestingly, Coase himself seems to point in this direction when suggesting that, when traders are distant, private ordering is not enough for enabling markets (Coase 1988:10).²⁷

²⁶ Presenting these solutions as private ordering likely underestimates their reliance on the state and, more generally, the interaction between local and wider institutions in parallel with the scope of the relevant market. The discussion therefore resonates in the debate in history about the power of private property to enable a functional market economy. See, in general, Ogilvie and Carus (2014) and, for a sample of cases, Edwards and Ogilvie (2012a) and Sgard (2015), who reinterpret the case of the Champagne fairs with a much greater role for public order; Edwards and Ogilvie (2012b), who claim that the Maghribi traders combined private and public enforcement; Kadens (2012), who argues that the customary origin of the medieval law merchant is a myth; Arruñada (2012:111), who stresses the role of the state in some of the cases described by Anderson and Hill (2004); and Masten and Prüfer (2014), who explain the emergence of the law merchant and its later supersession by state courts as adaptation to different circumstances. Most of these analyses focus on contractual institutions, but those developed in primitive or allegedly stateless societies to transact property rights also rely, instead of on private ordering, on public procedures which are functionally similar to those used by modern states (Arruñada 2003:406–11).

²⁷ In his opinion, “it is evident that, for their operation, markets such as those that exist today require more than the provision of physical facilities in which buying and selling can take place. They also require the establishment of legal rules governing the rights and duties of those carrying out these transactions in these facilities. Such legal rules may be made *by those who organize the markets*, as is the case with most commodities exchanges.... When the physical facilities are scattered and owned by a vast number of people with very different interests, as it is

5. Policy Implications of Disregarding Sequential Exchange

The preceding section has argued that the role of the state differs between single and sequential exchange. In particular, in rem enforcement requires some additional mandatory rules and a wider scope of impartiality. In this context, maintaining the assumption of single exchange has helped inspire and sustain repeated failures in specific public policies that deal with problems of sequential exchange. These failures are more directly linked to three consequences of the single exchange assumption: the focus on the initial allocation of property rights, the lack of attention to legal rights, and the tendency to overestimate the power of private ordering.

This section briefly analyzes these alleged failures and proposes some corrections based on the minimum elements of public ordering identified in the preceding section. Taking these elements into account should allow more exhaustive consideration of the tradeoffs involved when deciding on the degree of in rem enforcement and how to implement it. This would avoid policy mistakes that unduly expand public intervention, reduce it to the point at which in rem enforcement is endangered, or organize dysfunctional verification solutions. The analysis does not aim to prescribe either a high degree of in rem enforcement or specific solutions (based, for instance, on possession, public registries or hybrid forms) for implementing it, which will generally hinge on the particular features of the specific markets and other institutions.

5.1. *Emphasis on Initial Allocation of Rights*

First, focusing on the initial allocation of property rights with a corresponding disregard of the need for recurrent allocation risks lending support to unbalanced efforts in both land titling and business formalization projects. These efforts concentrate expenditures in the first steps of the process without paying attention to the demand for formalization, its value and sustainability. Such projects either exaggerate the demand for subsequent transactions—thus justifying their own existence—, or forget about subsequent transactions altogether—thus supporting dubious administrative simplification of initial formalities. Consequently, despite spending considerable

the case with retailing and wholesaling, the establishment and administration of a private legal system would be very difficult. Those operating in these markets have to depend, therefore, on *the legal system of the State*” (Coase 1988:10, emphasis added).

amounts of resources in both areas of land titling and business formalization, their results have often been disappointing.

Many land titling projects seem to consider sequential exchange when they claim to “mobilize dead capital” (de Soto et al. 1986, de Soto 2000), that is, placing land on the market and using it as collateral for credit. In so doing, they assume that substantial demand for subsequent transactions exists and is blocked by unclear titles. However, such demand hinges on economic opportunities for trade and on enforceability, and neither should be taken for granted. In fact, the importance of unclear titles often pales compared to other sources of transaction costs, mainly taxes. And enforceability is often lacking. For instance, real property registries are necessary for using land as collateral for credit but, whatever the quality of registries, the demand for collateralized credit does not materialize if mortgages are not enforceable, as is the case in many closely-knit local communities.²⁸

A similar disregard for subsequent transactions explains why initiatives to formalize informal business firms and to simplify business formalities often pay attention only to initial formalization procedures, without considering the future costs of remaining formal (mainly taxes but also registries’ renewal fees) or, less obvious but equally important, the value of formalization services for reducing future transaction costs,²⁹ which is determined by the reliability of registries’ information and, in particular, by what judges think about the quality of

²⁸ Typically in many of these projects, as exemplified by the Peruvian case (Arruñada 2012:148–50), second transactions remain unregistered (Bruce et al. 2007:42) and there is little or no secured lending (Deininger and Feder 2009:233), often because of the difficulties of enforcing repossessions by outsiders.

²⁹ Many experimental studies observe that reducing the costs of initial formalization of business firms causes only a small and temporary effect, if any, on formalization: for example, De Mel, McKenzie and Woodruff (2008 and 2013), Kaplan, Piedra and Seira (2011), and Galiani, Meléndez and Navajas (2015). As one of these studies concludes, “firms remain informal, not because burdensome entry costs deter them from operating formally, but because they perceive the benefits of formality to be modest at best” (Galiani, Meléndez and Navajas 2015:5).

such information.³⁰ Instead, most of these initiatives, which have proliferated in parallel in several international organizations,³¹ consider only the costs incurred by entrepreneurs for the incorporation of companies (even in countries with few companies), disregarding all other costs and benefits. Consequently, they lead reformers to reduce the average time and cost of incorporation when the priorities, especially in developing countries, should often be to allow individual entrepreneurs to operate formally without being legally registered as such and, for companies, to achieve registries that are sufficiently reliable for their services to inform judges and therefore reduce parties' transaction costs.³² (The fact that not all company founders are entrepreneurs but may be using the company for extractive purposes—for instance, tax evasion—opens still another avenue for discussion: facilitation of initial allocation of rights may increase social transaction costs in the future.)

Cross-country quantitative indicators of land and business registries' performance, epitomized by the Doing Business indicators on registering property and starting business, are the most extreme version of this over-emphasizing of the initial allocation of rights. Mainly, by considering only the initial formalization costs, they blind policymakers to the tradeoffs between initial and future transaction and administrative costs. Overall, the information they provide on initial costs might be useful if it were reliable (which it is not: see Arruñada 2007, IEG 2008),

³⁰ See Arruñada (2010:179–82; and 2012:122–25).

³¹ Such as the OECD (2003, 2006); the European Commission, with its “Charter for Small Enterprises” (CEE 2004); and the World Bank, with its *Doing Business* indicators (2004–15).

³² This is not to deny that entry barriers may be a major deterrent for economic development; and serious entry barriers do remain in many markets, probably more so in developing economies. But the binding ones are not located now in the legal formalization process, which is generally open to all at a low cost, too low in fact to qualify as a significant barrier to entry. Mixing serious entry barriers with trivial ones entails the risk of setting mistaken priorities and implementing distractive policies. In particular, misuse of the “entry” label for initial formalization costs, which is common in the business start-up literature, causes confusion and exaggerates their importance. Compare, for example, how the empirical results of Alesina (2005) on business *entry* are presented by Djankov (2009) as referred to “start-up reforms”.

but should be used with care, bearing in mind its partial nature. Failure to do so explains why the use of these indicators has been falling into the old “management by numbers” trap into which many large firms fell in the 1950s and 1960s (Hayes and Abernathy 1980).

Conversely, considering sequential exchange advises different criteria for selecting, designing and evaluating titling and business formalization projects. First, when launching a new project, more attention should be paid to current contracting practices. Especially, if economic agents are already relying on vicarious solutions, such as implementing secured credit through sales with repurchase agreements, this confirms that true demand for titling exists and therefore advises that resources should be spent on titling institutions. If such vicarious solutions are not common, such demand likely does not exist, even if survey respondents say otherwise. Second, the priority when organizing or reforming registries should be for them to provide reliable judicial inputs. Ensuring this evidentiary quality is often more important than minimizing formalization costs, a common objective of reforms.³³ Even if institutional efficiency depends on achieving the right tradeoffs between costs and benefits, including legal quality, the fact that only reliable, independent registries are able to produce in rem rights should be borne in mind when considering such tradeoffs. Third, when evaluating reforms, the focus should be not only on how many land parcels or business firms have been titled or formalized but also on how many *subsequent* transactions (second sales, mortgages, new businesses) have taken place and what proportion of them has been formalized. Lastly, although full consideration of the tradeoffs between initial allocation (or formalization) and ex post transaction costs would be impossible, reform efforts should at least estimate some major later costs and benefits by measuring, for

³³ Mistaken priorities in this area are also common in developed countries, as illustrated by the US foreclosure crisis, discussed above, which resulted from efforts to reduce transaction costs ex ante without considering how this was increasing future enforcement costs. “To facilitate securitization, deal architects developed alternative ‘contracting’ regimes for mortgage title: UCC Article 9 and MERS, a private mortgage registry. These new regimes reduced the cost of securitization by dispensing with demonstrative formalities, but at the expense of reduced clarity of title, which raised the costs of mortgage enforcement” (Levitin 2013:637).

example, the incidence of litigation and the contractual and judicial processes whose effectiveness can be attributed to registries' performance.³⁴

5.2. *Disregard of Legal Rights*

Second, misunderstanding the interaction between legal and economic rights and, in particular, disregarding the foundational role of legal rights also lends support to institutional reforms with mistaken priorities: mainly, land titling projects that confound and even privilege geographical over legal demarcation of land; and simplification reforms that in their pursuit of synergies integrate administrative and contractual registries, losing sight of the fact that, since they serve different functions, they require different organizations.

On the one hand, land demarcation has both a physical and a legal component. Physical demarcation involves measuring and defining the boundaries of a land tract. It is often performed by land surveyors hired by one party, most commonly the owners or the government. Legal

³⁴ This is not what the revised Doing Business indicators are doing. After the changes introduced in 2014, Doing Business maintains its old biases but aims to calculate numbers more precisely by, for instance, adding more cities or including vague promises of comprehensiveness (IFC-WB 2014). It also claims to consider the value of formalization services but its concrete steps to measure it are disappointing, as they focus on easy-to-measure but minor elements. For example, the revised "Registering property" index, first published in the 2016 version of the indicators (World Bank 2015), "will complement the current ones measuring the *efficiency of the land title transfer process*. It will look at, for example, the reliability of the information recorded by the land administration system (such as *whether there is an electronic database for checking maps and cadastral information*) and the transparency of that information (such as whether there are official statistics on the number of transactions at the land registry). Other aspects measured will include the extent to which the land registry and cadastre provide for *complete geographic coverage of land parcels* and the accessibility of mechanisms for resolving land disputes" (IFC-WB 2014:2, emphasis added). In addition to focusing on such minor elements, the inordinate attention paid to geographic information is also revealing in the light of the argument developed in the next section.

demarcation is the end result of a process based on a “purging” procedure in which owners of neighboring tracts consent on some definition of a tract’s boundaries or, otherwise, oppose it in order to assert their claims. Eventually an agreement will be reached by all relevant parties or a judicial decision will be passed on the matter. It is only after the land is thus *legally* demarcated that boundaries have legal force in rem. For example, whatever the physical demarcation accompanying a deed and whatever the promises given by the seller with respect to boundaries, neighbors can still enforce in rem their boundary claims against the buyer who, were they right, will have only a claim against the seller—and possibly the surveyor—for the deficiency with respect to the promised demarcation. Therefore, land demarcation is also the product of both purely private contractual exchange and the functionally “public” gathering of consents characteristic of property transactions, a public stage that can be performed by different means for different dimensions relating to the definition of property rights. For instance, for land registration, it is usually enough if parcels are identified even if their boundaries are not perfectly demarcated.³⁵

Conversely, disregarding the legal dimension of property leads physical demarcation to be considered more effective than it really is. A prominent example of this emphasis on the physical component of land demarcation is the interpretation by Libecap and Lueck (2011) that the findings of their seminal work on land demarcation, described above in n. 1, are caused by rectangular surveying. In fact, it is unclear to what extent the differences they observe in land value, investment, transactions and litigation should be attributed to physical or, more likely, legal land demarcation, given that their two samples of parcels differ not only in the physical demarcation technique used but also in the way the land was allocated to settlers, and, consequently, the legal quality of their ownership titles. Where land was demarcated by rectangular survey (RS), settlers were granted specific parcels, guaranteeing no overlaps or

³⁵ In any case, whatever the titling system, when boundaries are less precisely defined, they are not abandoned in the public domain, as suggested by Barzel (1982) for costly-to-measure property rights, but are defined by the informal mechanisms of adverse possession and acquisitive prescription, which allow for an implicit purge of rights to take place ex post, instead of by a formal and costlier purge taking place ex ante.

conflicting claims. But, where land was demarcated by “metes and bounds” (MB), settlers were given a right to appropriate a certain area, which then was freely chosen by each settler, privately surveyed and recorded, without, in principle, undergoing any purging procedure to avoid overlaps and clear the title. Consequently, whether the differences observed by Libecap and Lueck capture the effects of the different demarcation systems or those of alternative allocation and titling procedures is unknown, and their results probably overestimate the relative importance of physical demarcation by including those of the different allocation procedures used in that case for RS and MB lands. In particular, their results might reflect the fact that the boundaries of plots under MB have not been purged and are therefore likely to overlap those of neighboring plots. In this case, both contracted and reported acreage under MB would systematically overestimate the legal acreage really sold, as parties would try to keep their boundary claims alive. Therefore, the acre prices that they observe under MB would underestimate real prices.³⁶

The legal nature of physical demarcation is missing in policy, as land titling projects still spend most of their resources on mapping and surveying,³⁷ two activities that, by themselves, are of little value and often end up being unsustainable (Arruñada 2012:141–43). These projects would gain instead from copying older registries and aiming for sustainability, focusing on parcel identification but relying on possession for establishing the verifiability of physical boundaries. Proper consideration of legal rights advises a more nuanced treatment of physical

³⁶ This titling hypothesis is consistent with the fact that Libecap and Lueck observe such value differences in farmland but not in urban land, whose boundaries are usually more precise. It is also consistent with their finding that most 19th century litigation in metes and bounds areas is not related to boundaries (1.46 by 1,000 parcels, about 4 times more than in rectangular survey areas) or to the validity of the survey (2.48%, 31 times more) but to the validity of the entry/patent (8.61%, 33 times more) (Libecap and Lueck 2011:453). Lack of clarity in the title seems to have been more important as a driver of litigation and, possibly, of transactions costs and value.

³⁷ Adding the numbers provided by Burns (2007:94–95) shows that at least 53.45 percent of the unit costs of land titling projects is being spent on physically identifying parcels.

and geographic information in titling efforts. Parcel identification is necessary but establishing boundaries should not be considered a requirement for land titling. Investments to demarcate land by mapping the area and identifying parcel boundaries can therefore be transformed into a variable cost by allowing voluntary parcel identifications of different quality, so that greater precision is applied when most valuable. This would also tie in with the fact that the value of physical demarcation depends on the nature of the land: for example, surveying is only customary for commercial transactions in the USA (Madison, Zinman, and Bender 1999, 14).

On the other hand, disregard for the legal nature of private property rights also leads to “contractual” (i.e., property and company) and necessarily impartial registries being seen as mere depositories of information and therefore good candidates for integration with “administrative” (mainly, tax) and inevitably partial registries.³⁸ The appeal of such integration has been enhanced by the advent of information technologies, as their costly introduction made the possibility of integrating part of their functions more appealing, from entering data to controlling registration or even merging records. The benefits of this greater integration, which may affect the user interface, the back office, or both, stem from the two types of registries relying on the same information and performing some similar activities. Separate registries duplicate both entry and control procedures, as well as some of the information on record. For instance, owners and entrepreneurs may have to file documents in two or more offices, and some of the information in these documents may be the same. For example, part of the data in company incorporation documents is the same as that given when registering a firm with the tax authority or the social security agency. Moreover, duplication may occur in both single and repeated filings.

However, integration also involves substantial risks because, given their different purposes, contractual and administrative registries have different demands and often rely on different resources and organizations. In particular, they use different types of specialized knowledge and

³⁸ In real property, these policies often aim to integrate the land register with the tax cadastre. The recurrent failure to achieve a functional land register in Greece provides a prominent example of the costs involved (Taylor and Papadimas 2015). In the business area, these integration policies often lead to the creation of public “single windows” and “one-stop shops” that reduce explicit costs to users but increase their hidden tax burdens (Arruñada 2010).

implement different incentive structures. For a start, the data on file often serve different functions. For example, real property registries work effectively with less precise geographical identification than cadastres, which are often used for planning purposes, such as building roads. Therefore, the type of knowledge necessary for exercising their functions is substantially different. And their different purposes also entail different demands. First, contractual and administrative registries, respectively, support bilateral contracting and unilateral enforcement. Hence, delays in contractual registries preclude further transactions, whereas in administrative registries they merely postpone enforcement. Second, entry in contractual registries can usually be kept on a voluntary basis, whereas entry in administrative registries must often be mandatory, as they are designed to avoid negative externalities.

Consequently, organizational constraints and incentive structures for different types of registries are also different. Registration procedures need to be stricter in contractual registries to ensure independence, because they bestow rights, not only obligations, on the filing users or their future contractual parties. Conversely, cadastres, the paradigm of administrative registries, are declarative: if someone claims to be in possession of land, most cadastres will have no trouble believing that person because their entries only create obligations for declarers. In contrast, property registries have to implement rigorous registration procedures to check the quality of title or attest the date of filing because they bestow rights on filers or, more commonly, concede economic benefits to filers by bestowing rights on subsequent third-party innocent acquirers. In addition, the incentives necessary to operate their processes are also different: contractual registries need to be impartial with regard to the transacting parties, on the one hand, and third parties, on the other; whereas administrative registries serve and are run by one of the parties, the government.

Considering sequential exchange advises an alternative strategy: improving the interaction between public agencies and private facilitators, while preserving the independence of the agencies and exploiting the strengths and specialization advantages of public and private operators. This would enable private single windows to be competitively designed by market forces, such as the business facilitating and information services that have been developing for

decades.³⁹ A sensible policy would therefore focus on creating flexible public-private interfaces with the bureaucracies in charge of the public core of formalization services while allowing the free market to organize a multifaceted intermediate sector, comprising all sorts of intermediaries offering final users a variety of more or less integrated services (a variety of *private* single windows).⁴⁰ Public agencies could then focus their efforts on building such virtual interfaces that private providers of support services could then integrate in a modular fashion. This alternative strategy also holds a lesson for indicators of institutional performance: instead of precluding any consideration of private facilitators, their prices should be taken as a market proxy of performance: for example, for company incorporation, the price of “shelf” companies is a much more comprehensive proxy of the ex ante costs of incorporation than the biased partial numbers produced by Doing Business (Arruñada 2012:205–208).

5.3. *Overestimation of Private Ordering*

Lastly, disregarding contract interaction and sequential exchange leads to overestimation of the effectiveness of private ordering. Policy consequences are visible in an array of institutional and regulatory reforms that naively liberalize outdated palliative services such as those of

³⁹ Observe that these facilitate interaction with public registries in both the filing of documents and the exploitation of registries’ information. Benefits should arise in both processes. Potential benefits from having redundant repositories of information (Stephenson 2011:1462–75) are limited to exceptional cases in which impartiality is not in doubt because the information has been produced in the past. This was the case with the private abstracts of title that were used for reconstructing the public records of Chicago burned in the 1871 Fire.

⁴⁰ Given that each agency has its own “regulatory space”, coordination problems tend to be prevalent (Freeman and Rossi 2012), but they remain when their different bureaucracies are integrated under a single roof. What is proposed here is for the market to play a greater role in providing coordination services.

conveyancers and notaries public, without realizing that success hinges on reforming registries instead.⁴¹ Meanwhile, underdeveloped or ineffective registries remain untouched.

This confusion of priorities is inevitable when, in line with a single exchange perspective, the conveyancing industry is seen as independent of property registries. A striking example was provided by the ZERP report on the reform of legal services in real estate transactions in the European Union (ZERP 2007),⁴² which was instrumental in inspiring European policy in this sector, putting pressure on national governments to liberalize conveyancing. In fact, the reforms of notaries initiated in 2014 in France and Italy follow this line by liberalizing some aspects of notaries' activity without strengthening the functioning of registries, which in both countries are

⁴¹ These effects are most visible with respect to services that substitute for those of property and company registries, as there is some evidence that these services are less costly and extensive in jurisdictions that have more effective registries, both in real property (Arruñada 2012:156–60) and companies (Arruñada and Manzanares 2015).

⁴² The report classified conveyancing systems according to the intervention of different kinds of conveyancers, with such kinds defined according to their name and historical origin (notaries, lawyers, or real estate agents) but without paying attention to their function, which, from a sequential exchange view, is driven not by their name or history but by the type of registry existing in each country. Indeed the type of registry defines by default the functions actually performed by conveyancers, whether these are lawyers in common law countries, notaries in civil law countries, or real estate agents in Scandinavia. Consequently, the report could not explain why highly regulated conveyancers, such as those of Germany and Spain, exhibited lower legal costs. But this finding was surprising only within the report's misleading framework: conveyancing costs depend mainly on the nature of the property registry in place. For the same reason, the report was widely off the mark when considering that the Netherlands has a unique titling system whereas it is simply a recordation system with mandatory intervention by notaries public (Nogueroles 2007:124).

mere recordings of deeds.⁴³ This policy is misguided on two counts. First, by forgetting to reinforce registries, it blocks substantial reform. Second, with registries as they stand today, liberalizing conveyancers may be counterproductive because it makes it harder for them to perform their palliative function of protecting third party interests.⁴⁴

The experience of previous reforms in the Netherlands, where most notaries' prices were freed after 1999 and some freedom of entry was allowed into each other's reserved markets, supports these doubts. In addition to an initial increase in some dimensions of competition,⁴⁵ no change was detected in perceived quality by notary clients (the parties choosing the notary), but the quality attributes controlled by the property registry did decline (Nahuis and Noailly 2005), confirming that greater competition leads to weaker control of externalities. Moreover, Dutch notaries have also been involved in mortgage and real estate fraud (Lankhorst and Nelen 2004:176–79, Preesman 2008, and Macintyre 2008). Rather than merely liberalizing the price of conveyancing services, what is required for reducing not only the costs but also the demand for palliative conveyancing services is to make public titling more effective. This may require a movement toward registration of rights or, at least, adding to mere recordation of deeds tract

⁴³ In France, the *Loi Macron* (2015) liberalized the entry and hiring of professionals, but subject to detailed rules and constraints. Italy also liberalized advertising and entry, and reduced the number of documents subject to mandatory notarization (Guidi 2015).

⁴⁴ In these broad reforms, there are elements that clearly go in the right direction, especially when reducing the mandatory use of notaries in areas in which they are not necessary because there are no substantial externalities. For example, since 2006 it is not necessary to retain a notary to sell a used car in Italy. The problem is that services with these characteristics are few in number and scope because registries remains underdeveloped and making them more effective is not a priority of these reforms.

⁴⁵ Cross subsidies were reduced, resulting in higher fees for family services and lower fees for high-price transactions (Kuijpers, Noailly, and Vollaard 2005). Yet there were hardly any entries, with most new notaries joining established offices (CMN 2003), an observation consistent with the empirical assessment by Noailly and Nahuis (2010) that the reforms did not affect entry decisions.

indexes and a check by the registry that grantors are on record, two features that are still absent not only in most of the United States but also in Italy (Nogueroles Peiró 2007).

Moreover, even if reforms of notaries public come up against strong vested interests, which is often presented as a merit,⁴⁶ this is shortsighted and even pyrrhic: the rents of each individual professional are likely to be reduced but the social cost will not be substantially reduced because outdated registries based on recordation of deeds, which are the main source of inefficiency, remain unchanged. Reforms that do not improve registries end up merely dissipating professionals' rents while maintaining demand for the profession and, by ensuring its survival, make it possible for it to recapture the lost rents in the future, when regulation is reintroduced. This is precisely what happened in The Netherlands: after the abovementioned changes and frauds, supervision of the profession was tightened, to the point that, instead of deregulation, "the amount of regulation . . . increased dramatically" (Verstappen 2008, 21).

Furthermore, registry reform should bring cost reductions in conveyancing but of a different order of magnitude. Legal transaction costs (that is, the sum of conveyancing plus registration fees) in land sales and mortgages differ drastically depending on the type of registry involved. In a sample of European countries, when measured as a percentage of the average home sale, they are 86.47% higher under recordation than under registration (Arruñada 2012:159). And almost all of these cost savings (close to 96%) take place in conveyancing: for the average residential sale, average registry fees are practically the same (0.30% of home value under recordation and 0.26% under registration), but solicitors' and notaries' fees twice as big (being, respectively, 1.48 and 0.69%).

This analysis is applicable to other areas which, on the surface, seem to have little in common with the conveyancing of real property. A case in point is the trading of financial derivatives, which can proceed Over the Counter (OTC), being arranged by investment banks that then play a role partly similar to that played by property conveyancers in a purely private context without land registries (banks design the contract but not the underlying financial asset);

⁴⁶ See, for example, "Notaries Public to the Barricades," *The Wall Street Journal*, December 12, 2014; "The Struggle for Reform in France and Italy," *Financial Times*, December 12, 2014; or "Notaries: The Princes of Paperwork," *The Economist*, March 21, 2015.

or, alternatively, rely on clearinghouses and organized exchanges for trading more standardized contracts.⁴⁷ The tradeoff of costs and benefits is also similar, with two of the main elements replicating more general discussions in property: for example, the value of derivative customization poses an issue similar to that of the *numerus clausus* of rights in rem, while negative externalities of OTC trading in derivatives also pose similar issues to those arising when such rights are created privately.⁴⁸ The cost savings involved are also substantial.⁴⁹

6. Summary

In order to better understand property institutions, we need to focus on the transaction costs involved in sequential exchange with interaction between contracts, a type of exchange that is essential for specialization in contractual functions. In sequential exchange, not only use externalities but also exchange externalities are prevalent, and two additional elements of public ordering are needed to contain them: mandatory rules must establish the conditions for in rem

⁴⁷ A prominent example is the reform adopted by the US Congress in July 2010, which required routine transactions to be traded on exchanges and routed through clearinghouses, as well as customized swaps to be reported to central repositories (mainly, Title VII of the Dodd-Frank Wall Street Reform and Consumer Protection Act). In particular, the Act required that most swaps be guaranteed by clearinghouses and executed on electronic and regulated platforms, known as swap-execution facilities, instead of over the phone.

⁴⁸ The Act has been controversial, with different views on its costs, benefits and effectiveness. Compare, for example, Caballero and Simsek (2013), who model a “complexity externality” that supports moving OTC transactions to exchanges as a preemptive measure to simplify and increase market transparency; and Roe (2013), who argues that clearinghouses are fragile with respect to systemic risks.

⁴⁹ A report by McKinsey & Co. estimated that the shift of trading towards organized platforms triggered in the USA by the Dodd-Frank Act would cause losses of 4.5 billion dollars, 35% of the revenue of the investment banks that had previously operated this OTC market (Rudisuli and Schifter 2014).

enforcement, and enforcers must enjoy a wider scope of impartiality. Private-ordering arrangements can play an effective role in providing verifiability services but only under such conditions.

Moreover, the interaction between contract and property law also changes, with contract law governing the inter-party manifestation of the consents needed in what is necessarily a double-stage (private and public) property transaction. Property law institutions—broadly defined, to include those dealing with all types of sequential exchange—also become the key mechanism for making truly impersonal exchange possible, this being understood as exchange in property, in rem, rights whose value is independent of parties' personal attributes.

I contend that this sequential-exchange perspective is necessary for economic analysis to throw light on some important problems. To date, most microeconomic models contemplate contractual problems and solutions. Such solutions are suitable for personal exchange so they force market participants to rely on personal safeguards and the potential benefits of in rem enforcement and impersonal exchange are squandered. Moreover, this purely contractual view is behind a variety of specific policy failures, such as focusing reforms too narrowly on the liberalization of private contractual specialists (such as conveyancers, title insurers, patent lawyers, investment bankers) without proper development of market-enabling central outfits, such as registries and organized markets for financial derivatives, which are implicitly considered to be bureaucratic hurdles. More generally, such reform policies tend to disregard the conditions of public ordering necessary for such public outfits to perform their functions and for private ordering to play an effective, if complementary, role in providing verification services.

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