CONVERGENCE AND DIVERGENCE IN SYSTEMS OF PROPERTY LAW: THEORETICAL AND EMPIRICAL ANALYSES*

**YUN-CHIEN CHANG† & HENRY E. SMITH‡**

This Article utilizes a unique data set of property laws in 119 jurisdictions in the world to test convergence/divergence theories in comparative property law. Our theory predicts that first, because legal systems face similar positive transaction costs in delineating property rights, the structure of property law among all jurisdictions in the world will converge or remain similar since some time in the distant past. Second, our theory posits that the style of property law will tend to converge when the

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* We thank Richard Epstein, Saul Levmore, Charles Delmotte, Adam Mossoff, Ariel Porat, Christopher Serkin, and WU Ying Chieh for helpful comments and the Classical Liberal Institute at New York University for inviting us to present at the Convergence and Divergence in Private Law Symposium held at the New York University School of Law on November 2–3, 2018.

† Research Professor & Director of Center for Empirical Legal Studies, Institutum Iurisprudentiae, Academia Sinica, Taiwan. J.S.D., New York University School of Law. Email: kleiber@sinica.edu.tw. This Article is funded by Academia Sinica’s Career Development Award 106-H02. For coding of property law in the 100 plus jurisdictions, I thank my research assistants over five years from Taiwan, Peru, New Zealand, India, Israel, Colombia, China, Hong Kong, Singapore, Uganda, Turkey, France, and South Africa. They are Winnie Awino, Harika Bakaraju, Gahli Berger, Paloma Carreno, Jung-Han Chang, Danlin Chang, Gina Chavarry, Meng-Xin Cai, Chih-jui Chen, Tzu-Yuan Chu, Yichen Chu, Gital Dames, Huseyin Guzeler, Melanie Lee, Ingrid Lee, Christina Lee, Calvin Lim, Tin-jun Liu, Hannah Musgrave, Maria Oluyeju, Anne-Line Schwint, Zun Wei and Daniella Weinrauch. The librarians at the University of Chicago Law School and Cornell Law School provided great help in identifying foreign law materials when I was a visiting professor there. Some of the aforementioned research assistants are LL.M. students at Chicago and Cornell. The University of Chicago Law School also covered the expenses for the LL.M. research assistants. The law library at the University of Iowa College of Law also provided me with foreign legal materials when I was the Bonfield Fellow for 2016. Prof. XU Guodong, though we have never met in person, allowed me to photocopy his civil code collections.

‡ Fessenden Professor of Law and Director of the Project on the Foundations of Private Law, Harvard Law School. Email: hesmith@law.harvard.edu. For her excellent research assistance, I would like to thank Kelsey Mollura.
doctrines in question are isolated, but diverge when they are interconnected. Our data and descriptive analysis support the theory. Doctrines regarding possession, sales, condominiums, tenancies in common, and limited property rights serve as prominent examples.

KEYWORDS

numerus clausus principle, tenancy in common, possession, sales, condominium

INTRODUCTION

Comparative property law faces the familiar challenge of choosing a unit of comparison. What do we compare and why? Doctrines with similar labels might serve different functions, their labels being a mere etymological accident. Examples include civil law “real rights” (rights in things) versus common law “real property,” or civilian “cause” (the reason for a contract) versus “cause” in the common law of torts.1 Alternatively, doctrines with very different labels can show a high degree of similarity, as in common law adverse possession and civil law prescriptive acquisition.

So far so familiar. And yet the comparative problem of identifying the proper subject matter of inquiries into convergence or divergence is at its extreme in the case of property. To get a handle on what to expect in terms of convergence and divergence among systems of property law, we need a theory of how those systems work and what problems they are meant to solve. If the contours of property systems reflect the ends they are supposed to serve and the costs of achieving those ends, we can start to predict how these forces will play out in the comparative arena.

We take as our starting point an account of property’s overall architecture and its functional motivation. Property law serves as a platform for the interaction of actors in society with respect to things. Because our potential uses of resources often conflict, and most of the external objects of the world are only contingently associated with any actor, the law needs a way to protect uses, prioritize decisions about use, and facilitate the coordination of actors’ uses. In a world of zero transaction costs, we could formulate the law governing such interactions in a fully articulated fashion: every micro-action by each actor impacting each other actor with respect to each aspect of each resource would be the subject matter of a legal rule, and such rules could condition on any combination of features of other actors,

things, or relations. The complexity here quickly becomes intractable. In our world, property law employs (legal) things and a combination of exclusion and governance strategies to manage this complexity. Because this management function could not be accomplished by contract alone or through a more articulated activity-based tort law, we can call it the “essential function” of property law. And because every modern property system faces this problem to roughly the same gross extent, we can expect some similarity in the institutional responses to this basic problem. Separating the world into more or less distinct things and affording to owners rights based on exclusion over these things is a first cut, which is then refined through more use-based governance strategies that take care of especially important interactions between actors.

As with other law, we can distinguish the structure and the style of a system of property law. The structure of property law refers to how property law groups problems so that they need not be treated in a fully articulated fashion, and in so reshaping problems, property law serves an essential function—a function that cannot be replicated by contract. For the property systems we will be investigating, the manner of carving up the set of resource-related activities turns out to be some version of a hybrid of exclusion and governance strategies. Property law identifies things and affords owners the right to exclude, as implemented in property torts like trespass and conversion, and fine-tunes this package with rules of governance. In real property, these governance devices include nuisance, easements, covenants, and zoning, and in personal property they include bailments. In both areas, governance devices also include leases and


3. For further discussion on employing things and their possession to manage this complexity, see Henry E. Smith, The Elements of Possession, in LAW AND ECONOMICS OF POSSESSION 65, 67 (Yun-chien Chang ed., 2015); Henry E. Smith, Property as the Law of Things, 125 HARV. L. REV. 1691, 1701–08 (2012) [hereinafter Smith, Property as the Law of Things].


mortgages. Sophisticated hybrids of exclusion and governance are also possible, ranging from condominiums to partnerships and corporations, and, in the common law world, to the trust. The need to employ a system based on a mixture of exclusion and governance stems from the problem of protecting uses at a positive cost, not least the intractability of an unstructured system.

Serving the essential function of property—protecting uses in a world of positive institution costs—still leaves a great deal of freedom in terms of how to serve those objectives within the framework. In any set of cultural artifacts, including law, style is a characteristic manner of doing things. Families of legal systems, like common law and civil law, have sometimes been defined in terms of style, although we will not prejudge this matter here. In property law, an example of style would be the reliance on possession and a more implicit definition of ownership in common law systems versus the definition of dominion and departures from it in typical civilian systems. Likewise, a lease can be a contract given in rem protection or can be delineated as an in rem right of a limited scope. Styles of property law show great persistence overall, in at least some of their aspects. As with styles generally, this can be attributed to path dependence; because law exhibits network effects, it is difficult to change even in the face of equally good or even superior alternatives.

Structure and style raise the issue of how tightly a given aspect of property law is integrated into the overall system. Private law doctrines that are most integrated into its overall system are the most difficult to change; doctrines that are easily treated in isolation, with fewer ripple effects, are conversely much easier to modify. In property law, the various doctrines

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and institutional features sometimes interlock and sometimes do not. Those that are highly interconnected with the rest of the system, like possession, might be expected to be difficult to change, in contrast to doctrines that can safely be treated in isolation, like the contractual aspects of leases.

Our approach to convergence and divergence is rooted in a combination of the relative propensity to change and the relative closeness of starting points. In a system like property, which is some combination of spontaneous order and design, change over time (whatever its source) will flourish or be cut off depending on the resultant fitness (however defined) of the overall system. Drawing on a well-known evolutionary model, Lee Alston and Bernardo Mueller add this aspect to the bundle of rights.\(^{10}\) The various elements of the bundle of rights—rights to grow tomatoes, rights to build a shed, rights to walk and so forth—may be relatively isolated or show “epistatic” connections.\(^{11}\) In an epistatic connection, a change in one element will lead to an effect on a connected element. Thus, a change in one gene may produce an effect in another gene, if they are epistatically connected. Likewise, the right to draw water affects the value of the right to grow tomatoes, but the right to prevent airplane overflights is (presumably) unconnected to either the right to draw water or the right to grow tomatoes.

Once epistatic connections are in the picture, the implications of different patterns and densities of epistatic connections for the evolution of property rights are likely to be quite important. Along a spectrum, we can distinguish three types of scenarios. First, the elements in the bundle of rights might be wholly unconnected. If we get the answer right for each element, then all we have to do is add up the effects of all the elements, and we can be assured that we have optimized the entire bundle. Often, in the conventional post-realist bundle of rights picture, exactly this disaggregated pattern with no epistatic connections is assumed. If so, it is easy to change individual elements without the downside of severe, unrelated (by epistatic connection) negative effects emerging in the bundle. However, assuming epistatic connections away is unrealistic (for example, water and farming),


\(^{11}\) Alston & Mueller, supra note 10, at 2267–68.
even if convenient.

At the opposite extreme, we might have maximal epistatic connections: everything is connected with everything else. If so, the pattern of consequences to minor variations in one element of the bundle is random or chaotic and very hard to predict. This pessimistic picture does not describe our world either. Sometimes problems, like high-altitude airplane overflights, can indeed be treated largely in isolation from other problems.

In between these two extremes of zero and total connectivity is what has sometimes been called “organized complexity.” 12 Here, epistatic connections are important but far from universal. They can also be clustered. Innovation is promoted by the fact that interconnection is not complete and is semi-organized. 13 Either by design or through spontaneous variation, changes to part of the bundle can be made, and the overall effect can move in the direction of a local optimum more easily than under complete connection (and the chaotic landscape it corresponds to). This is another sense in which the bundle of rights (if one wishes to call it that) is a structured one. 14

The notions of essential function and interconnection allow us to form expectations or even predictions about the convergence and divergence of property systems. Structural aspects of modern property systems that solve the basic problem of managing use conflict and avoiding intractability will cause some convergence on the exclusion-governance architecture. To be sure, the relative emphasis on exclusion and governance will vary according to local conditions, and in particular, it will be easier to add, subtract, or modify governance rules than it will be for analogous changes to the exclusionary setup. Property systems will converge in having a mix of exclusion and governance and will diverge more in the area of governance than in exclusion, as exclusion is one of the three essential elements in property. 15 We should also expect that, because in general it is more

detachable from the system, stylistic variation more easily arises in
governance than in exclusion. So, our first proposition is that structural
aspects of property law should show convergence and the structures in
question should be stable over time. More tellingly, even if the initial
condition of the property structure is no exclusion at all, this arrangement is
unlikely to persist if open access does not make sense on its own terms (that
is, it fails to provide benefits that exceed the costs, or compares unfavorably
with other arrangements that could be implemented).  

A prime example is the people’s commune during the Cultural Revolution in China. Private
property and individual farming had been the norm and practice, but during
the revolution the government mandated a shift to limited-access common
property. As is well known, this social experiment did not last long. The
structure of property law, therefore, will converge to an exclusion-based
system, regardless of the initial conditions.

When it comes to more stylistic features, we must distinguish between
those that are more interconnected and those that are less interconnected with
the rest of the system of property law. Our second proposition holds that, in
any aspect of the property system that is less interconnected, we should
expect more stylistic variation. Tighter interconnection will lead to more
uncontained ripple effects and a more jagged fitness landscape, such that it
is harder to achieve higher peaks of fitness. Conversely, less interconnected
doctrines can respond to pressures for improvement, whether designed or
not, and the improvement to that one piece of the system leads directly to an
overall unambiguous contribution to fitness.

We might offer a third, dynamic, proposition: the less interconnected
an aspect of the property system is, the more we should expect that it could
change over time for a variety of reasons. One of these reasons is voluntary
borrowing, or legal transplants due to colonialism. Previous work has found
that in the admittedly small number of mixed systems that have both

16. According to Professor Harold Demsetz’s famous theory, once resources become more
valuable, property rights are likely to emerge to internalize externalities. See Harold Demsetz, Toward a
Theory of Property Rights, 57 AM. ECON. REV. 347, 350 (1967). In this demand-side account, Demsetz
assumed that this would in practice favor greater exclusion. For extensions of this theory that allow for
the emergence of mixtures of exclusion and governance and that take into account the supply side, see
Thomas W. Merrill, The Demsetz Thesis and the Evolution of Property Rights, 31 J. LEGAL STUD. S331,
S333–38 (2002) (summarizing contributions to a symposium extending the Demsetz model to account
for the supply of property rights, including non-exclusion-based rights).

17. See Yun-chien Chang & Henry E. Smith, The Numerus Clausus Principle, Property Customs,
and the Emergence of New Property Forms, 100 IOWA L. REV. 2275, 2303 (2015) (noting that new
property forms emerge from the commons arrangement).

18. For an explanation of fitness landscapes and their peaks, see Alston & Mueller, supra note 10,
at 2260–67.
common and civil law heritages, there is a tendency to borrow contract law more than property law (never the latter without the former), and within property law to borrow more in the in personam than in the in rem aspects. Thus, in terms of changes over time, we might expect that stylistic features would converge or diverge but that more rapid changes would take place in less connected, rather than in more connected, areas of property law.

Now, after decades or centuries of evolution in property law, we might be more likely to observe the convergence of isolated (less interconnected) doctrines, if at least one of the following conditions holds: (1) there is one or a few apparently dominant strategies; (2) convergence in a global market saves transaction costs and attracts investment and business; or (3) there have been conscious or subconscious, voluntary or involuntary borrowing or legal transplants, with or without explicit efficiency concerns. This is not the place to propose a full-fledged convergence and divergence theory. Our key point here is only that less interconnected doctrines are more likely to vary (resulting in divergence or convergence depending on background conditions) than more interconnected ones.

In this Article, we employ a snapshot of current property systems. We are not in a position to test the third proposition—that the interconnectedness of doctrines should correlate with rapidity of change. As for the first two, assuming that systems are not subject to overwhelming pressures to converge, we can isolate our expectations: property systems should show more convergence in their less interconnected than in their more interconnected aspects. This is based on the particular conditions of our world. If all countries had the same property law to begin with, we would see that more interconnected parts of the property system remain the same—they would remain convergent. Less interconnected parts of the property system, given that they cannot become more convergent, and they vary more, will become relatively divergent. Of course, this is not our world. We live in one where the common and civil law have very different starting points

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(styles) in terms of property law.\textsuperscript{23} The civil law system is also inherently plural. Hence, what is more interconnected has different starting points and remains divergent, whereas what is less interconnected could diverge or converge due to one or more of the three forces laid out above. By contrast, the basic structure is highly systemic and so should show more convergence than do more structurally peripheral aspects. And among styles of property law, we should expect those that are connected to the rest of the law to retain their greater diversity. Our theoretical framework is summarized in Table 1.

### TABLE 1. Convergence–Divergence Hypothesis

<table>
<thead>
<tr>
<th>Aspects in Property System</th>
<th>Initial Conditions</th>
<th>During Evolution</th>
<th>Observed Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure</td>
<td>Same (exclusion-governance based system)</td>
<td>Remain</td>
<td>Convergent*</td>
</tr>
<tr>
<td>Structure</td>
<td>Different (e.g., open access)</td>
<td>Cannot sustain</td>
<td>Convergent</td>
</tr>
<tr>
<td>Style, interconnected</td>
<td>Same</td>
<td>Hardly change</td>
<td>Convergent</td>
</tr>
<tr>
<td>Style, interconnected</td>
<td>Different</td>
<td>Hardly change</td>
<td>Divergent*</td>
</tr>
<tr>
<td>Style, isolated</td>
<td>Same</td>
<td>Vary</td>
<td>Divergent (by definition, cannot become convergent)</td>
</tr>
<tr>
<td>Style, isolated</td>
<td>Different</td>
<td>Vary (e.g., borrowing, transplanting, efficiency conformity)</td>
<td>Convergent*</td>
</tr>
<tr>
<td>Style, isolated</td>
<td>Different</td>
<td>Vary (e.g., for national identity; cultural difference)</td>
<td>Divergent</td>
</tr>
</tbody>
</table>

*Note: * marks the situations in most countries in our world.

Aided by a unique data set on property laws in 119 jurisdictions in the world (see Figure 1),\textsuperscript{24} we find that many property issues, as of 2015, are

\textsuperscript{23} See Chang & Smith, *Economic Analysis*, supra note 6, at 36–54.

\textsuperscript{24} The data set as a whole contains 155 jurisdictions. In this Article, we limit our attention to the
still framed in drastically different fashions. For instance, in civil law
countries, *rei vindicatio*—the action to force someone to return possession
of a thing to its owner—is the major right of a property owner, while this
expression is almost nontranslatable into a legal term in English
(“revindication” is the usual English word, which means nothing to
common-law lawyers). Property owners in the common law, of course, are
generally well protected—by different means with different labels (trespass,
conversion, replevin, and so forth).

**FIGURE 1. Jurisdictions Used in the Analysis**

![Map of Jurisdictions](image)

Structures of property, on the other hand, do appear to converge. Most
jurisdictions, in their civil codes or case law, address the same types of
property issues. This suggests that the problem of serving property’s
functions at positive information cost everywhere creates the same disputes.

119 jurisdictions that either have a civil code or are English common-law jurisdictions (including Israel,
South Africa, and Scotland, which are mixed jurisdictions that have been heavily influenced by English
common law). Thirty-six jurisdictions are excluded because their property laws may have been less
comprehensively identified. Thus, the data set’s lack of information regarding these jurisdictions may or
may not reflect the underdevelopment of property law—it may not, in the case of Nordic countries.

More specifically, the 119 jurisdictions studied here include the following: Afghanistan, Albania,
Algeria, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahrain, Belarus,
Belgium, Bolivia, Brazil, Burkina Faso, Burundi, California, Cambodia, Cape Verde, Chile, China,
Colombia, Comoros, Costa Rica, Cuba, Czech Republic, Dominican Republic, Ecuador, Egypt, El
Salvador, England and Wales, Equatorial Guinea, Eritrea, Ethiopia, France, Georgia, Germany, Greece,
Guatemala, Guinea, Guinea-Bissau, Haiti, Honduras, Hong Kong, Hungary, India, Indonesia, Iran, Iraq,
Ireland, Israel, Italy, Ivory Coast, Japan, Jordan, Kazakhstan, Kuwait, Kyrgyzstan, Latvia, Libya,
Liechtenstein, Lithuania, Louisiana, Luxembourg, Macau, Madagascar, Malaysia, Malta, Mauritius,
Mexico, Moldova, Monaco, Mongolia, Mozambique, Netherlands, New York, New Zealand, Nicaragua,
Niger, Nigeria, North Korea, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Puerto
Rico, Qatar, Quebec, Romania, Russia, Rwanda, São Tomé and Príncipe, Scotland, Seychelles,
Singapore, Slovakia, South Africa, South Korea, Spain, Switzerland, Syria, Taiwan, Tajikistan, Thailand,
Timor-Leste, Togo, Tunisia, Turkey, Turkmenistan, Ukraine, United Arab Emirates, Uruguay,
Uzbekistan, Venezuela, and Vietnam.
Uncertainty over titles to real or personal property gives rise to the adverse possession doctrine. High costs of verifying true owners of movables put on sale lead to the good-faith purchaser doctrine. Use rights and security rights, while often bearing very different names (for example, the land charge in England is functionally equivalent to the Reallast in Germany), are staples in virtually all property systems. Moreover, jurisdictions around the globe adopt only around ten limited property forms, and many jurisdictions explicitly reserve to the legislature the power to create new forms.

The exact contents of property doctrines do not necessarily converge. Lawmakers around the world face the same issue of positive information costs, but the same problem does not always call for the same solution. Information costs only force legal systems to come up with a solution, but often anything goes. Many, if not most, doctrines mix structural and stylistic aspects. When lawmakers for any reason settle on a solution, etched in civil codes or leading cases, they do not always have strong reasons to change the solution to become more like other jurisdictions.

Specifically, concrete solutions are more likely to converge if the doctrine in question is more isolated from other doctrines. This is true of structural and especially of stylistic aspects of law. In an interconnected doctrine, such as the definition of possession, convergence (indeed, any deviation from the status quo) requires moving other pieces in the whole system to go along with the change. Especially in the civil law world, the fear of unintended consequences in changing a foundational doctrine in a civil code could kill any proposal for deviation. France and Germany each have their own conceptual system of possession, which is hard to uproot after hundreds of years of doctrinal interpretation. When European scholars proposed the Draft Common Frame of Reference, they neither found common ground nor simplified the concept. Instead, they managed to keep the two conceptual systems of possession together—creating a lot of confusion and contradiction. By contrast, a “downstream” doctrine that is more isolated from other doctrines has more wiggle room, as, in the worst-

25. See infra Section I.A.
26. See infra Section I.B.
28. See infra Section II.A.
case scenario, a failed experiment would not drag the whole system down with it. Co-ownership partition is a prime example of such a doctrine. The aforementioned data show that ninety-one jurisdictions (77%) prefer partition in kind and allow partition by sale. 31 The widely adopted condominium form is another example. 32

To be sure, we do not claim that isolation and interconnection are the only reason for doctrines to converge or diverge. Many other factors—the benefit of convergence, for one—affect lawmakers’ decisions. That is, large benefits of convergence may push interconnected doctrines toward convergence. Europe’s effort in streamlining registration of mortgages is a case in point. By contrast, small benefits of convergence will leave isolated doctrines untouched. Doctrines related to accession and finders are two examples.

In addition, rigorously testing convergence and divergence empirically would require a panel data set with 100 plus jurisdictions over the past several decades. Powered by such a panel data set, scholars could chart the evolution of property doctrines to examine whether they were the same or different in the beginning or became similar or dissimilar to one another over time. Unfortunately, no such data sets are available. Our approach is to use property laws around the world in 2015 as a snapshot and inquire whether they are the same (convergent) or still different (divergent).

I. CONVERGENCE IN STRUCTURE

Our first proposition is that property systems will converge in terms of their structure. The structure of property law responds to function more than does what we call “style.” The latter is a way of achieving a function that could easily be different, and it functions mainly as a method of communication among actors in a legal system. Because structure is functionally motivated in a deeper and more thorough sense, we expect that similar functional needs will be reflected in similar property structures—to the extent that property law responds to those functional needs. We further hypothesize that some very basic functions served by property law systems, and important constraints on the devices each system utilizes, are prevalent across jurisdictions. We are not yet in a position to test this proposition comprehensively. Nevertheless, highly suggestive illustrative evidence is available from our snapshot of 119 jurisdictions. In this Section, we will present evidence from devices, like adverse possession, that respond to the

31. See infra Section III.A.
32. See infra Section III.B.
cost of verifying titles and from principles, like the limited number of property forms, that manage information costs.

A. HIGH INFORMATION COSTS OF VERIFYING TITLES

The information costs for potential transactors to verify the identities of current owners have been high everywhere most of the time throughout history. Therefore, countries around the world, through legal transplants or imitations, develop similar strategies for reducing the expenditure of information costs to reasonable levels. Well-known doctrines such as adverse possession and good-faith purchase are cases in point. Indeed, 82 of the 119 jurisdictions (69%) have adverse possession doctrines that enable, at a minimum, good-faith possessors to acquire ownership of items of personal property. In 11 additional jurisdictions (9%) that are greatly influenced by French law, there is no need for an adverse possession doctrine for movables, as possessors of movables are immediately presumed to be the owners. 108 of the 119 jurisdictions (91%) have the good-faith purchase doctrine or the French doctrine that presumes all possessors to be owners. 108 of the 119 jurisdictions (91%) have an adverse possession doctrine that at least enables good-faith possessors to acquire ownership of land. Notably, 20 jurisdictions explicitly limit the application of the adverse possession doctrine to unregistered land. Since the main justification for the adverse possession doctrine in the contemporary world is clearing titles and aligning the gap between de jure and de facto ownership arising from high information costs, a categorical rule that excludes registered land makes sense, as information costs for verifying titles to registered land should not be high.

B. LIMITATIONS ON THE NUMBER AND KINDS OF PROPERTY FORMS

As property has in rem effects, a large number of limited property forms carved out of ownership create information costs for all potential transactors; they need to discover, understand, and price the encumbrance of such rights on real and personal property. One popular way to control the level of such information costs is to adopt a closed system, the numeros clausus, under which only the legislature can invent new property forms. As Figure 2 shows,

50 of the 119 jurisdictions (42%) explicitly stipulate the *numerus clausus* principle. Those that do not, such as states in the United States,35 may endorse and enforce it in practice without promulgating the principle in statutes. Countries like South Korea and Taiwan allow custom to create new forms, but in practice very few, if any, new forms have been recognized through custom. Some systems, like those of Norway36 and South Africa,37 purport to have a *numerus apertus* (or open number) of forms, but in practice are quite strictly closed. Likewise, even Spain’s *numerus apertus* system is heavily limited by its registrars’ reluctance to register new forms.38

35. See Merrill & Smith, supra note 13, at 9–11, 23–24, 60.

36. Although in terms of law on the books, Norway does not have a *numerus clausus* principle and may even be said to have a *numerus apertus* principle, strong norms of legal practice and a high degree of consensus about background norms may serve to constrain the nonlegislative creation of new property forms—an event that rarely occurs. On the pragmatic nature of Norwegian property law, see generally Geir Stenseth, *The Importance of the Social Function of Property—Norway*, in *THE SOCIAL OBLIGATION NORM OF PROPERTY AND ITS CONTEMPORARY RELEVANCE* (Jessica Viven-Wilksch & Paul Babie eds. trans., 2d ed. forthcoming 2019). For similar reasons, Norwegian law can be more accommodating of custom without creating a serious information-cost problem for third parties. See generally Peter Ørebech, *Western Scandinavia: Exit Bürgerliches Gesetzbuch—the Resurrection of Customary Laws*, 48 Tex. Int’l L.J. 405 (2013) (discussing the role that customary law has played in Western Scandinavia).


38. In Spain, any real property right can be registered. See Ley Hipotecaria art. 2 (B.O.E. 1946, 58); Reglamento Hipotecario art. 7 (B.O.E. 1947, 106). In practice, the set of forms is not completely open, because the Spanish registrar ends up standardizing the forms—the Dirección General de los Registros y del Notariado, an office within the registrar, decides whether a right has the nature of real property. Nonetheless, there are examples where the Spanish registrar accepted new forms of real rights that had not had formal legal recognition. We thank Vanessa Casado Perez for this point.
Another way to control information costs is to adopt only a small number of property forms. The recursive nature of property forms and, in common law jurisdictions, the existence of the trust, to a large extent make unnecessary a significant number of forms. Basic forms, such as the mortgage and the usufruct (leaseholds and life estates being partial functional substitutes), go a long way in increasing the value of property. The data set we use includes twenty-six types of limited property forms. Figure 3 shows that most countries have around ten forms. (The North Korean Civil Code contains zero limited property forms.) Certain forms are core, with high adoption rates: easement (99%), mortgage of real properties (98%), pledge of personal properties (97%), pledge over rights (82%), usufruct (82%), and rights of retention (roughly, the combination of artisan’s lien, mechanic’s lien, and warehouseman’s lien) (76%).

40. Temporal forms such as reversioners and remainders in the fee system are excluded. A few idiosyncratic forms that only exist in one or two countries (such as China) are also excluded. Our statistics thus may slightly underestimate the number of property forms in some countries, but our basic takeaway lesson remains the same. Note that ownership and co-ownership are not counted as limited property forms.
41. Regarding such a lien in, say, Taiwan, see YUN-CHIEN CHANG ET AL., PROPERTY AND TRUST LAW IN TAIWAN 128–29 (2017).
Figure 3. Distribution of Limited Property Forms

Note: N=119.

II. DIVERGENCE IN INTERCONNECTED DOCTRINES

We do not expect convergence across the board. Instead, doctrines that are more interconnected with the rest of the system of property law should be expected to resist convergence if they start out in a divergent state. Such divergence will be a possibility mainly for stylistic aspects of property law because of the structural convergence explored in the previous section. An interconnected doctrine is difficult to change because the change will cause more severe and widespread knock-on effects throughout the law. Thus, our second proposition holds that more interconnected doctrines will show more stylistic divergence (and as taken up in the next Section, less interconnected doctrines will tend to show more stylistic convergence across property systems). We illustrate interconnected doctrines in the areas of possession, sales, and temporal divisions of property.

A. POSSESSION

Possession is the root of many property law doctrines, such as adverse possession, first possession, delivery of items of personal property for purposes of sale, good-faith purchase, and so forth. That the law recognizes something along the lines of possession is structural and is convergent across
As Professor Thomas Merrill points out, possession is a common-sensical cue that ordinary persons in everyday life can understand. Moreover, using possession as a proxy for boundaries helps enforce the exclusion-based structure of property. But what kind of possession doctrine to implement in the law is stylistic and interconnected. That is, the specific definition of possession, while only different on the margins, is difficult to change. We see this at work in civil law jurisdictions, where several versions of intention requirements for possession exist, as shown in Table 2. By contrast, one has a hard time identifying judicial or statutory definitions of possession in common law jurisdictions, even though they have the same second-order doctrines (adverse possession and so forth).

We doubt that in practice any such intention requirement will make a substantial and substantive difference, and yet, the doctrine has not converged. Perhaps more controversially, we also doubt in practice whether no-intention or *animus domini* as a precondition for possession has any real world consequences. Still, the doctrine remains divergent, probably because possession is a fundamental concept and lawmakers worry that changes in definition may bring unintended consequences. Possessory notions are not only important for protecting property rights through trespass and conversion, but they also play a role in doctrines like original acquisition and adverse possession—even in animal torts, as possessors of animals in Germany and Taiwan are liable in tort when the possessed animals injure other human beings.

Aspects of possession intersect with bailment and with agency, security interests, and the like. A change in the definition of possession might have implications throughout property law, which might

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43. For a classic statement of skepticism that there is anything to unify notions of possession across areas of U.S. property law, see Burke Shartel, *Meanings of Possession*, 16 MINN. L. REV. 611, 611–13 (1932).
require adjustment in those areas.

**TABLE 2. Intention Requirement for Possession**

<table>
<thead>
<tr>
<th>Intention</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Intention</td>
<td>65</td>
<td>54.6</td>
</tr>
<tr>
<td><em>Animus Domini</em></td>
<td>24</td>
<td>20.2</td>
</tr>
<tr>
<td>To Control</td>
<td>4</td>
<td>3.4</td>
</tr>
<tr>
<td>To Control for Oneself</td>
<td>9</td>
<td>7.6</td>
</tr>
<tr>
<td>Voluntary Mastering</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>To Be a Right Holder</td>
<td>6</td>
<td>5.0</td>
</tr>
<tr>
<td>To Exclude</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>Cannot Find Definition</td>
<td>8</td>
<td>6.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>119</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Jurisdictions differ in their choices in defining possession along other dimensions as well. Twelve non-common-law jurisdictions (10%) banish “agents in possession” (that is, employees relative to their employers) from the ranks of possessors, as do several common-law jurisdictions that distinguish possession on the one hand and custody or occupation on the other hand.\(^{45}\) Thirty-seven jurisdictions (31%) prefer the concept of *détention* (physical control along with a purpose to control on behalf of others), and provide that a person with only *détention* is not a possessor.

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\(^{45}\) *Ramakarane v. Centlec (Pty) Ltd.* 2016 (51) ZAFSCH at 17 (S. Afr.), http://www.saflii.org/za/cases/ZAFSCH/2016/51.pdf ("'[P]ossession’ means the physical or corporeal holding of the document pursuant to the right to its possession, as in the case of an agent or bailee; ‘custody’ means the mere actual physical or corporeal holding of a document, regardless of the right to its possession, as in the case of a servant . . . .'\); *Brigitte Lurger & Wolfgang Faber, Principles of European Law on Acquisition and Loss of Ownership of Goods* 395 (2011) ("In England and Ireland, the term ‘custody’ is used to denote cases where the physical control is in a person’s hands, but the results of the possession are attributed to the possessor proper."); *Dilan Thampapillai et al., Australian Commercial Law* 11 (2015) ("Custody will occur where a party is holding the goods, but they do not have ownership or possession at law."); *Bruce Ziff, Principles of Property Law* 136 (6th ed. 2014) (observing that Canadian law distinguishes custody and possession but considering such a distinction “arcane”); *Possession and Custody in the Law of Larceny*, 30 YALE L.J. 613, 615 (1921) (pointing out that a servant is in custody while the master is in possession).
B. Sales

What constitutes a valid sale is highly divergent across jurisdictions.\textsuperscript{46} To transfer title to movables, in fifty-eight jurisdictions (49\%) a valid sale contract itself does the trick; in fifty jurisdictions (42\%), delivery (possession changing hands) is sometimes or always required; and in nine jurisdictions affected by English law, a title transfers when parties intend it to.\textsuperscript{47} Clearly, sales are connected with a complicated web of other property doctrines—for instance, do \textit{constitutum possessorium} (in which the original owner becomes a mere possessor for the acquirer of the item in question)\textsuperscript{48} and attornment (in which the seller agrees to assign to the buyer the right to reclaim the thing in question from a third party) count as delivery by default?\textsuperscript{49} Is there a “real agreement” (\textit{dingliche Einigung}) in addition to the sale contract?\textsuperscript{50} Are the two levels of contracts always invalid at the same time?\textsuperscript{51} Are the services of notaries or attorneys required to execute sale contracts? And so on. For a jurisdiction to change from an intention-based system to a delivery-based system, many foundational principles have to make way.

Sales of immovables are also a case in point. In fourteen jurisdictions (12\%), a valid sale contract is sufficient to sell land and buildings. In thirty-seven jurisdictions (31\%), recording creates an “opposability effect” to third parties.\textsuperscript{52} In sixty-three jurisdictions (53\%), registration is necessary. Twelve of these sixty-three jurisdictions conceptualize a real agreement as one necessary element in a sale. Here, it is apparent that changing the doctrine creates ripple effects on the design of the register and the markets of middlemen and professionals. Interestingly, anecdotal evidence suggests that in France and Japan, two opposability countries, basically all sales of real

\textsuperscript{46.} As with possession, whether to provide for sales is quite structural and convergent, but deciding what constitutes a sale is stylistic and interconnected—and quite divergent, as discussed in the text. \textsuperscript{47.} See Yun-chien Chang, \textit{Wealth Transfer Laws in 153 Jurisdictions: An Empirical Comparative Law Approach}, 103 IOWA L. REV. 1915, 1932–40 (2018). \textsuperscript{48.} See CASES, MATERIALS AND TEXT ON PROPERTY LAW 817 (Sjef van Erp & Bram Akkermans eds., 2012). \textsuperscript{49.} See Chang, supra note 47, at 1939–40 tbl.1. \textsuperscript{50.} Real agreement, a German concept, “describes the meeting of minds during registration for real properties and delivery for personal properties as a separate, thing-related contract. That is, it takes two contracts and registration to transfer titles to real estates.” \textit{Id.} at 1926 (citation omitted). \textsuperscript{51.} See \textit{id.} at 1927–28. 

\textsuperscript{52.} In these jurisdictions, once a real estate sale contract is consummated, it binds the seller, and between the two transacting parties, the ownership is considered transferred to the buyer. If the transfer is not registered, and later the original seller sells the real estate to a third party who registers, the third party (second buyer) will become the owner, as against the first buyer and everyone else in the world. If instead the first buyer registers the transfer, it creates an opposability effect against everyone. Hence, no later buyer who buys from the original owner will become the owner.
estate are recorded. Hence, if they move away from opposability and require registration as a precondition for valid transfer, market practices would not need to change at all. The behaviors of sellers, buyers, and third parties would be the same. Still, there is no sign that France and Japan are making the change.

C. TEMPORAL DIVISION OF PROPERTY

Only 13 of the 155 jurisdictions, all with common-law heritage, recognize future interests. This is one feature that maps onto the common-civil division perfectly. Another is the property-form trust (as opposed to a trust-like contract that lacks the features of property). This feature can be expected to remain stable for a long time, because recognizing future interests or trusts would change the highly interconnected civil-law concept of ownership.

III. CONVERGENCE IN ISOLATED DOCTRINES

As opposed to interconnected doctrines that tend to resist convergence and so tend to diverge, more isolated doctrines will tend to converge more across legal systems. We illustrate this with an analysis of the convergence in co-ownership and condominium doctrines, which can be altered without massive ripple effects through the rest of property law. These doctrines exhibit the expected convergence across jurisdictions.

A. CO-OWNERSHIP: MANAGEMENT, SALE, AND PARTITION

Doctrines regarding co-ownership demonstrate our point that convergence and divergence depend greatly on whether the doctrines are isolated or interconnected. This Section shows that voting rules for managing and selling co-ownership are more divergent than rules regarding judicial partition of co-ownership. Both sales and partitions end the co-ownership; co-ownership doctrines will not apply after sales and partitions. Doctrines related to solo ownership apply to solo-owned things after sales and partitions of those things, just as for other things that have never been co-owned. Between the two, we also expect the voting rules for sales to be more divergent than the partition rules, as the former have to interact with the voting rules for management. For example, lawmakers are unlikely to set the voting rules for sales at super-majority voting if the voting rules for

53. The trust in East Asia is contract-based. See Lusina Ho & Rebecca Lee, Emerging Principles of Asian Trust Law, in TRUST LAW IN ASIAN CIVIL LAW JURISDICTIONS 259, 278 (Lusina Ho & Rebecca Lee eds., 2013).
management require consensus. In comparison, partition is a unilateral right of any co-tenant, and judges usually have wide discretion as to the details of partition. Hence, judicial partition rules may change on the books while partition practices remain the same, making it easier for them to converge.

By contrast, a covenant to manage tenancy-in-common property among cotenants means that the complex relationship continues to exist. Lawmakers have to consider, in a whole package, how to structure other dimensions of co-ownership. For instance, is there a duration cap to a management covenant? If a covenant cannot be established without consensus, it is more reasonable to allow it to last longer. In addition, can a management covenant include a covenant not to partition during the agreed term of the management? (Seventy-six jurisdictions allow it.) Can courts end such a covenant not to partition should circumstances mandate it? (Twenty jurisdictions stipulate a rule like this.) Under what conditions does a management covenant bind transferees of shares? (Forty-one jurisdictions stipulate a rule like this regarding real property, whereas twenty-four jurisdictions do so regarding personal property.) Hence, countries cannot easily adopt new voting rules for managing co-owned properties, as property policies in other doctrines would need to change as well.

Tables 3 through 5 are consistent with our predictions. Regarding the voting rules for managing co-owned properties, both the majority rule and the consensus rule have a substantial number of supporters, but neither is adopted in more than half of the jurisdictions. In addition, multiple voting rules that are more complicated are adopted, too. As for the voting rules for selling co-owned properties, Table 4 demonstrates that a majority of jurisdictions favor the consensus rule, and the 119 jurisdictions have converged to three simple rules: consensus, majority, and super-majority voting. As for judicial approaches to partition, one rule (partition in kind is preferred and partition by sale is the second choice) is adopted in 60% of the jurisdictions. Two other popular approaches still prefer partition in kind and allow partition by sale, and only add additional options.

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54. See Yun-chien Chang, Tenancy in “Anticommons”? A Theoretical and Empirical Analysis of Co-Ownership, 4 J. LEGAL ANALYSIS 515, 536 (2012) (observing that a legal reform in Taiwan changed the judicial partition rule from no preference towards any mode to preferring partition in kind, but the percentages of partition in kind rulings before and after the reform remained constant).

55. In twenty-one jurisdictions, we cannot find any rule regarding co-ownership management. We suspect that in the absence of any explicit rule, consensus is the most likely fallback option. Even if this is the case, consensus voting does not garner support from a majority of jurisdictions.

56. If we count the twenty jurisdictions for which we cannot find explicit rules as adopting consensus voting, consensus voting is adopted in three-fourths of the jurisdictions.
TABLE 3. Voting Rules for Managing Co-owned Properties

<table>
<thead>
<tr>
<th>Voting Rules</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Majority</td>
<td>42</td>
<td>35.3</td>
</tr>
<tr>
<td>Super-majority</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>Consensus</td>
<td>32</td>
<td>26.9</td>
</tr>
<tr>
<td>Consensus; majority</td>
<td>5</td>
<td>4.2</td>
</tr>
<tr>
<td>Majority; consensus</td>
<td>6</td>
<td>5.0</td>
</tr>
<tr>
<td>Majority; super-majority</td>
<td>7</td>
<td>5.9</td>
</tr>
<tr>
<td>Consensus; super-majority</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>Consensus; judge decides</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>Court-appointed fiduciary dec</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>Anyone</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>No rule</td>
<td>21</td>
<td>17.7</td>
</tr>
<tr>
<td>Total</td>
<td>119</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Note:* If there are two rules in the first column, the first threshold is the principle, whereas the second threshold may apply under certain conditions.

<table>
<thead>
<tr>
<th>Voting Rules</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Majority</td>
<td>13</td>
<td>10.9</td>
</tr>
<tr>
<td>Super-majority</td>
<td>9</td>
<td>7.6</td>
</tr>
<tr>
<td>Consensus</td>
<td>70</td>
<td>58.8</td>
</tr>
<tr>
<td>Majority; consensus</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>Majority; super-majority</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>Consensus; super-majority</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>Consensus; judge decides</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>Court-appointed fiduciary decides</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>No rule</td>
<td>20</td>
<td>16.8</td>
</tr>
<tr>
<td>Total</td>
<td>119</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Notes: If there are two rules in the first column, the first threshold is the principle, whereas the second threshold may apply under certain conditions. Not all jurisdictions distinguish the management and sale of properties held in tenancy in common. Some only stipulate the administration of such co-owned properties. In such cases, both the management and sales are coded as administration.

TABLE 5. Judicial Partition Approaches

<table>
<thead>
<tr>
<th>Partition Approaches</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>In kind preferred; by sale</td>
<td>71</td>
<td>59.7</td>
</tr>
<tr>
<td>In kind preferred; internal auction; by sale</td>
<td>12</td>
<td>10.1</td>
</tr>
<tr>
<td>In kind preferred; by sale; sell shares to co-owners</td>
<td>8</td>
<td>6.7</td>
</tr>
<tr>
<td>In kind preferred; sell shares to co-owners; internal auction</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>Judge’s discretion</td>
<td>12</td>
<td>10.1</td>
</tr>
<tr>
<td>By sale, in kind each preferred sometimes</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>Refer to rules in other laws</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>No rule</td>
<td>14</td>
<td>11.8</td>
</tr>
<tr>
<td>Total</td>
<td>119</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Notes: The term “in kind” means partition in kind; “by sale” means partition by sale; “internal auction” is an auction in which the highest bidder can acquire the shares of the co-owner who wants out.
B. CONDOMINIUM

The condominium form is another example of a discrete device that shows convergence across jurisdictions. The condominium form was quickly recognized in at least eighty-nine jurisdictions (75%) after its invention. The condominium form is used almost exclusively in residential buildings, and by definition is not applicable to land, so recognizing this form would not mess up the co-ownership regime in land. Late-coming lawmakers can choose any form to structure high-rise residential buildings. For one, they can opt for the cooperative, but only one jurisdiction, Pakistan, recognizes the cooperative while not recognizing the condominium. As it turns out, many jurisdictions adopt the condominium form, as it does not interfere with existing doctrines.

CONCLUSION

Using data from 119 countries in 2015, we test the relationship between the interconnectedness of property doctrine and the degree of convergence and divergence in those doctrines across countries. Structural aspects of property, especially those that are in rem, tend to be integral to the system of property law, and as expected, we find that strategies for verifying titles and the limits on the number of property forms do indeed show convergence across legal systems. When it comes to more stylistic aspects of property, we find the expected contrast between those that are more and those that are less interconnected with the rest of property law. Because property solves the problem of managing uses at positive information cost, and network effects lead to path dependence, we expect interconnected doctrines to show more variation across countries, given the different starting points that many countries exhibit. Lynchpin doctrines like possession, sales, and temporal division diverge across countries, while more isolated doctrines involving features of co-ownership such as sale, partition, and condominium show greater convergence. We leave the dynamic implications of our functional account for further work. Even in the snapshot we are able to offer here, the picture of property that emerges is one in which the functions of property law play out differently depending on their integration into the overall system.

57. In seventy-eight of the eighty-nine jurisdictions, their civil codes provide for the condominium form. In the other eleven jurisdictions, it is other statutes that do so.

58. Louisiana is an interesting exception. The condominium form is not included in its civil code at all and was only enabled by the Louisiana Condominium Act. This may be due to the ill-conceived claim by the Louisiana Supreme Court that the condominium form is “illégitime under a civilian understanding of property.” See George M. Armstrong, Jr., Louisiana Condominium Law and the Civilian Tradition, 46 La. L. Rev. 65, 65 (1985) (citing Lasyone v. Emerson, 57 So. 2d 906 (La. 1952)).