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## Property and the Construction of the Information Economy: A Neo-Polanyian Ontology

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## **Property and the Construction of the Information Economy: A Neo-Polanyian Ontology**

Draft prepared for inclusion in Leah Lievrouw & Brian Loader, eds., *Handbook of Digital Media and Communication*

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This chapter considers the changing roles and forms of information property within the political economy of informational capitalism. I begin with an overview of the principal methods used in law and in media and communications studies, respectively, to study information property, considering both what each disciplinary cluster traditionally has emphasized and newer, hybrid directions. Next, I develop a three-part framework for analyzing information property as a set of emergent institutional formations that both work to produce and are themselves produced by other evolving political-economic arrangements. The framework considers patterns of change in existing legal institutions for intellectual property, the ongoing dematerialization and datafication of both traditional and new inputs to economic production, and the emerging logics of economic organization within which information resources (and property rights) are mobilized. Finally, I consider the implications of that framing for two very different contemporary information property projects, one relating to data flows within platform-based business models and the other to information commons.

### **1. Property's Disciplinarity<sup>1</sup>**

Legal scholarship on information property traditionally has been concerned with internal justifications and has relied for the most part on methods broadly associated with liberal political theory. Models of intellectual property rights derived from neoclassical economics and analytic philosophy have favored ideal, abstract forms organized around considerations such as the presumptive connection between appropriation and productive development (e.g., Landes & Posner 2003) or that between exclusive control and minimization of information and transaction costs (e.g., Smith 2007). Models derived from liberal political philosophy link exclusive control with protection of the creator's natural rights (e.g., Epstein 2011). (Although the above-cited works all favor maximalist approaches to intellectual property protection, important work favoring more restrained approaches also emanates from each of these methodological traditions. Some economic theorists of intellectual property emphasize the positive spillovers that flow from limiting rightholder control (e.g., Frischmann & Lemley 2007) and some political philosophers of

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<sup>1</sup> Here I am acutely conscious of having left many important works and scholars out. A full list would go on for much longer; unfortunately, however, word limits prevent this chapter from doing so.

intellectual property emphasize the liberty and speech interests of audiences and users (e.g., Gordon 1993; Benkler 1999).) Meanwhile, like critical legal theorists more generally, critical legal theorists of intellectual property have focused on deconstructing legal categories to expose their arbitrariness and illuminate the relationships between property and power (e.g., Boyle 1998; Jaszi 1994).

Investigations of information property by scholars who study media and communications, meanwhile, traditionally have tended to focus on the social and cultural effects of intellectual property regimes. Preferred methodologies span the social science toolkit but tend to be infused with framing insights from critical social theory. For example, media and communications scholars have explored the linkages between copyright ownership of media content and hegemonic control of meaning (e.g., Bettig 1996). Other work on a diverse collection of intellectual property-related topics including piracy, appropriation art, and other user-generated content draws on scholarly traditions that emphasize reader recoding and resistance (e.g., Coombe 1998).

Each cluster of disciplinarity has contributed usefully to the study of information property, but (as many of the above-cited authors themselves have ultimately concluded), that project demands a hybrid methodological approach that includes institutionalist, materialist, sociological and political economic lenses. Property arrangements are socially embedded institutions that systematically structure the conditions of resource access and use (Fennell 2013). Such institutions may assume a variety of configurations (Cohen 2015), so although the property label packs an important rhetorical punch, it is also important to pay attention to scope-defining rules and operational details. This point leads directly into consideration of materiality. Although the very existence of intellectual property protection makes plain that property does not simply reduce to materiality and can exist without it (or, alternatively, that under the right conditions, the label “property” can be deployed to reify intangibles), differences in materiality do correlate to systematic differences in the design of property institutions for different resources (*ibid.*).

The material properties of digital objects and communications networks, however, are highly configurable. Digital protocols have afforded new points of leverage for coding in control of informational goods, thereby elevating physical control as a key determinant of *de facto* propertization (Lessig 1998; Gillespie 2007). Both for this reason and because the material configurations of media artifacts and infrastructures have a range of other (anticipated and unanticipated) affordances (Boczkowski & Siles 2014; Lievrouw 2014), materiality must be reckoned with as an important factor shaping both user experiences and societal implications more generally.

Other considerations affecting the design of intellectual property institutions are sociological; institutions need to “work” within the communities that rely on them, and institutions that work to the detriment of disempowered communities can create pressing social justice problems. A diverse collection of scholars has begun to study these issues from a variety of perspectives, exploring the ways that intellectual property law shapes the experiences and behaviors of creators, firms, and others in an increasingly networked and globalizing economy (e.g., Burk 2015; Chon 2006; Cohen 2012; Gray, Sandvoss, & Harrington 2007; Schur 2009; Silbey 2015); and investigating movements for information commons and the communities that support them (e.g., Benkler 2006; Coleman 2013; Frischmann, et al. 2014; Kelty 2008).

Lastly, property institutions are situated within evolving systems of political economy, and both parts of that compound term are important to understanding how and why particular institutions work as they do. To begin with, property institutions and the constructs on which they rely reflect (perceived) imperatives flowing from prevailing modes of economic development, production, and organization. In practice, property constructs therefore often both reflect and elide considerations of power, simultaneously entrenching various forms of privilege and masking them with just-so stories about property, productivity and virtue. Property institutions also may express a wider range of political values, however. So, for example, Joseph Singer (2011) observes that property is a dominant modality of governance in democratic societies and that institutions facilitating widely distributed home ownership, in particular, have been understood as furthering democratic self-government. Bill Herman (2013) has charted the process by which public interest coalitions became a permanent fixture within the copyright legislative landscape.

Building on these observations about method and perspective, Part 2 explores the evolving relationships between legal institutions for intellectual property and the political economy of informational capitalism.

## **2. Institutionalizing Transformation: Intellectual Property and Evolving Political Economy**

One way to think about the relationship between information as property and the emergence of the information economy might be in simple, syllogistic terms: Just as the transition from agrarianism to industrialism appeared to demand the appropriation of natural resources and the unbridled commodification of labor, land, and money (Polanyi 1957), so the transition from industrialism to informationalism (Castells 1996; Schiller 2007) now appears to require the appropriation and commodification of other important resources. The relationships between intellectual property institutions and larger dynamics of economic and sociotechnical (re)organization are more complex than that formulation suggests, however.

Among economic historians, a useful frame for understanding the emergence of industrial capitalism has been Karl Polanyi's (1957) analysis of a "great transformation" in the system of political economy that involved large-scale appropriation of resources, but that also moved on conceptual and organizational levels. The basic factors of industrial production—labor, land, and money—were reconceptualized as commodities, while at the same time patterns of barter and exchange became detached from local communities and reembedded in the constructed mechanism of "the market." It was these developments that lent both momentum and legitimacy to the resource-directed activities about which so much has been written—the large-scale enclosures of land, displacement of populations, extraction of natural resources, and construction of factories. Together, these appropriative, conceptual and organizational shifts produced a decisive movement toward a capitalist political economy. Then, when the resulting dislocations become too extreme, they prompted a countermovement aimed at ameliorating their effects.

Extending the analytical frame and the metaphor of the double movement, it is useful to frame the emergence of informational capitalism in terms of three large-scale

shifts that together constitute a movement toward informational capitalism: the propertization (or enclosure) of intangible resources, the dematerialization of the basic factors of industrial production, and the embedding of patterns of barter and exchange within information platforms. Whether the effects of those changes will elicit a meaningful countermovement is yet to be seen, and the topic of a book in progress (Cohen, forthcoming), from which this chapter is adapted. Here, my purpose is simply to explore the ways that forms of information property both work to produce and are themselves produced by emerging economic arrangements.

### *a. Metamorphoses of “Intellectual Property”*

This section traces the evolution of the major systems of intellectual property protection over the course of the modern era, identifying three large trends. First, and predictably, legal protection for patents, copyrights, and trademarks has grown stronger, longer, and broader, while at the same time the justifications for granting protection have come to refer more directly to the motivations and presumed needs of production intermediaries and corporate brand owners. Second, the movement to an informational economy has produced large structural and conceptual shifts in the ways that rightholders understand, exploit and value patents, copyrights, and trademarks; in brief, intellectual property rights have begun to behave in more uniform, predictable, and monetizable ways—i.e., more like other components of corporate asset portfolios. Finally, the increasing value and diversity of informational byproducts has begun to produce a more diverse and differentiated landscape of intangible intellectual property entitlements.

From the beginning of the modern era, debates about patent and copyright policy have concerned the relationships between individual creators and production intermediaries—industrial firms on the patent side and publishers, motion picture producers, and record labels on the copyright side. That focus reflected practical realities: Although governments funded some large-scale scientific and technical research, industrial firms with access to capital assembled the research teams and the material resources needed to solve other kinds of large-scale technical problems and amassed the capital needed to manufacture and distribute the resulting industrial and consumer products. Similarly, before the advent of powerful desktop computing platforms put professional-quality editing capabilities within easy reach, access to specialized equipment was necessary to produce cultural goods in forms suitable for the mass market. Some cultural production was publicly funded, but much was not. Additionally, dissemination of creative outputs required access to printing presses, newsstands and bookstores, movie theaters, or broadcast airwaves.

It is unsurprising, then, that the patent and copyright regimes that evolved during the twentieth century were designed to facilitate industrial production and dissemination of intangible goods. New treaties and statutes altered the scope of patents and copyrights in ways that favored powerful new industries, giving patentable subject matter broad and openended scope, redefining copyright to cover the byproducts of new recording, broadcast, and computer technologies, and granting copyrights uniform and lengthy terms (Litman 1987; Litman 2001; Merges 2000). Today, the patent and copyright regimes in force in developed countries (and extended via the world trade system to developing and

least developed countries) contain broad, general rights and narrow, specific limitations that eliminate latitude for many nonprofit and downstream uses of copyrighted works and patented inventions. Assignment of economic interests in intellectual property from employees to employers is routine. (In the U.S. copyright system, corporate employers own their employees' creations from the outset.)

Twentieth-century debates about intellectual property policy also reveal a gradual shift in the tenor of the prevailing justifications for granting patents and copyrights. Although policy debates continued to refer to the motivations of individual creators, new strands of justification began to emerge that emphasized the claims of intermediaries more directly. In Continental European copyright debates, the rhetoric of individual creatorship increasingly was deployed to justify control by intermediaries such as performing rights organizations. In the U.S., whereas nineteenth-century instrumentalist rhetoric had emphasized the public benefits to be gained from underwriting progress in science and learning, the distinctive flavor of instrumentalism that developed over the course of the twentieth century focused more narrowly on incentives to production. The turn to incentives provided a point of entry for express consideration of the incentives of the production intermediaries without which, as the argument went, many intangible intellectual goods would not be produced and distributed at all (e.g., Landes & Posner 2003). Most recently, in disputes raising questions about harmonization with international intellectual property developments, some courts and commentators have evinced a willingness to abandon creator-centric rhetoric altogether, focusing instead on concerns about the balance of power in international trade.<sup>2</sup>

The changes to trademark law have been equally dramatic. Within the traditional hierarchy of intellectual property rights that emerged over the nineteenth and early twentieth centuries, trademarks were inferior rights that served principally to protect against unfair diversion of trade, not to confer broad property entitlements operative regardless of context (McKenna 2007). More recently, economic justifications for trademark protection have emphasized signaling about consistent product quality. By the early twentieth century, however, brands and branding had begun to assume very different persuasive and performative functions. A prime mover in that shift was the nascent marketing industry, which early on came to envision its role as that of identifying desirable types of customers and devising more effective ways to reach them (Turow 1997). The shift to persuasion gathered velocity as mass media markets and technologies evolved (*ibid.*; Ang 1991).

For consumers on the receiving end of contemporary marketing strategies, brands and branding have come to function both as tools for self-articulation and as heuristics for social sorting. Brands and branding underwrite complex systems of performative and fundamentally social consumption, enabling consumers to signify class allegiance and to draw conclusions about others' allegiances and social status. Those systems reflect the deliberate efforts of marketers who seem to have internalized the core tenets of

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<sup>2</sup> See, for example, *Golan v. Holder*, 132 S. Ct. 873, 889 (2012) ("Full compliance with Berne, Congress had reason to believe, would expand the foreign markets available to U.S. authors and invigorate protection against piracy of U.S. works abroad, thereby benefitting copyright-intensive industries stateside and inducing greater investment in the creative process.").

poststructuralist thought about the cultural construction of identity and meaning (Holt 2004; McDonagh 2015).

As the expressive power of corporate brands assumed ever-increasing importance, both the legal framework governing brand-related activities and the justifications for affording protection have adapted in response, conferring on brand proprietors increasingly broad protection over brand atmospherics (Beebe 2010; Tushnet 2015). So, for example, although courts and commentators initially thought that trademarks reproduced on logo merchandise served purely aesthetic purposes, mark owners eventually convinced courts that most such reproductions signified sponsorship and therefore required authorization. That result effectively sheltered an increasingly broad web of licensing designed to encourage performative consumption and bolster brand atmospherics. Although courts and commentators initially characterized infringement lawsuits against down-market counterfeits as doctrinally and economically baseless, mark owners eventually convinced courts to find infringement based on a theory of “post-sale confusion,” or cognitive dissonance resulting from the mismatch between luxury signifier and down-market context.

As intellectual property doctrine, theory, and rhetoric have evolved to emphasize the primacy of corporate claims, deeper conceptual and structural changes also have been underway. Although individual patents, copyrights, and trademarks remain the theoretical basic units of protection, the industrial organization of cultural and technical production increasingly emphasizes amassing intangible capital at scale (Benkler 2002; Desai 2012; Parchomovsky & Wagner 2005). Portfolio-based intellectual property strategies in turn have begun to reshape legal doctrines. So, for example, as character copyrights have become cornerstones of merchandising campaigns, the test for character copyrightability has become correspondingly more lenient. As patent portfolios have become more central to competitive strategy in a variety of industries, courts have allowed claimants in certain industries to draft key enabling disclosures broadly and vaguely, and firms also have learned to practice selective disclosure in ways that both strengthen their own portfolio positions and disadvantage their competitors. Legal protection for trade dress—originally understood to mean specific packaging elements associated with a product or service—now provides broad protection for the “look and feel” of products, services, and even business establishments.

As important corporate assets increasingly have become informational in character, perceived needs for methods of defining and valuing legal entitlements in intangible intellectual goods have begun to reshape entire areas of law relating to such matters as secured finance, securities regulation, and taxation. Each of those fields, moreover, values certainty and predictability in asset definition, which in turn shapes the behavior of firms that develop, use, and transact in intangibles in ways that also have begun to reshape legal doctrines. So, for example, many disputes about consumer-oriented exceptions and limitations to copyright have become disputes about the weight to be given to norms and practices favoring licensing. Courts in patent validity disputes have developed ancillary tests that emphasize commercial success as an indicator of nonobviousness. Strict rules barring the licensing of trademarks without quality control and prohibiting transfers of marks without the accompanying business goodwill have

been relaxed, allowing complex webs of franchising, merchandising, and co-branding to flourish.

A final important set of changes involves a blurring of intellectual property law's traditional taxonomies. As intangible intellectual goods have become more varied, more important, and potentially more profitable, carefully delineated taxonomies of rights that originated in an earlier era have come to seem increasingly inadequate. New types of informational rights have mushroomed around the edges of existing entitlements: prohibitions against trademark dilution and "cybersquatting" that bolster the economic power of brand owners; regulatory entitlements that expand the window of exclusivity for patented pharmaceutical and biomedical products facing competition from generics; expanded rights in industrial design; and protections against "circumvention" of copy-protection technologies that effectively shield proprietary media platforms from unauthorized access. Some intellectual property scholars have decried the loss of conceptual purity, but from a different perspective these developments are entirely predictable; confronted with claims of economic urgency, seemingly arbitrary doctrinal obstacles have begun to melt away.

### ***b. Labor, Land, and Money—and People—Reimagined***

Two subjects conspicuously absent from the preceding section's narrative of expansion, reconceptualization, and augmentation of existing systems of intellectual property protection are data and algorithms, both of which have proved powerfully resistant to formal propertization. According to centuries-old intellectual property formulations, facts and formulas are public property. Appearances can be deceptive, however. As the movement to informational capitalism has gathered momentum, the three inputs that Polanyi identified as the basic factors of production in a capitalist political economy are undergoing a new process of transformation. The movement to an industrial economy reconstructed labor, land, and money as commodities; the movement to an informational economy is reconstructing labor, land, and money as dematerialized inputs to new and highly informationalized modes of profit extraction—i.e., as data. Additionally, data flows from the dematerialization of labor, land, and money have been joined by a new and highly lucrative fourth factor of production: personal information gathered from and about individuals and groups. Property formalism notwithstanding, these datafied resources are the subjects of active appropriation strategies that represent both economic and legal entrepreneurship.

As the movement to informational capitalism has gained velocity, finance has become both increasingly detached from the real-world activities that it originally served to enable and increasingly informationalized (Arrighi 1994; Van der Zwan 2014). Aided by rapid increases in processing power, investment bankers began using sophisticated computational models to devise more complex trades and trading algorithms and to develop new, ever more exotic financial instruments for "securitizing" a wide variety of activities. Meanwhile, new forms of intermediation have disrupted and restructured financial markets. The rise of hedge funds and proprietary exchanges for exotic derivative instruments, as well as the emergence of opportunities for "flash trading" in brief, technologically-mediated windows of market advantage, has partially



disintermediated conventional trading exchanges (Brummer 2015). At the same time, large financial conglomerates have developed their own trading platforms and devised a variety of other information-based strategies for (re)positioning themselves as the intermediaries of choice (Chiu 2016). Volumes of fee-generating, cashless transactions have skyrocketed, profiting both traditional banks and new payment intermediaries (Levitin 2017; Servon 2017). In all of these developments, a common denominator driving new profit strategies is privileged access to flows of information about trades and transactions.

Similar processes of dematerialization and financialization have produced dramatic changes in the conditions of labor. As digital communications networks have enabled just-in-time extraction of raw materials and automated, on-demand manufacturing and delivery, those changes have engendered new just-in-time labor contracting and scheduling practices. In similar fashion, service economy employers rely on forecasting algorithms and mobile communications technologies to retain, schedule, and release workers according to varying patterns of demand (Kalleberg 2009). In the terminology used by scholars of information-era labor practices, the proletariat has given way to the precariat, an intermittently employed workforce that is retained and compensated on an as-needed basis (Standing 2011). Most recently, high-profile, platform-based “disruptors” of existing labor arrangements have emerged in a number of service-related industries. These entities call themselves information businesses rather than, for example, temporary employment agencies or transportation businesses, and insist that, except for the people they hire to write their code and conduct their government relations operations, they do not actually employ anyone. Their true business, they argue, is disintermediation; they are simply facilitating the emergence of a new, freelancer-driven economy that is nimbler, more cost-effective, and less impersonal. Yet they also are reintermediators, converting the labor of user-workers (and user-customers) into flows of monetizable data (Scholz 2017).

Of the three Polanyian factors of industrial production, land might seem the most difficult to dematerialize. Yet land too has come to play an important role in the ongoing dematerialization and reconstruction of industrial-era resources as modular, highly informationalized assets. Consistent with the pattern of informationalized “innovation” in financial markets generally, new digital information and communication technologies have enabled the creation of new and increasingly complex derivative instruments based on the payment streams from mortgage lending (Levitin & Wachter 2012). Although the securitization process has slowed in the wake of the 2008 financial crisis, the volume of data-driven lending and securitization that preceded (and helped precipitate) the crisis means that, as a practical matter, significant interests in both residential and commercial real property remain highly datafied.

The role of law in these processes typically is characterized as passive or obstructive. Well-known narratives link each process to the disintermediation of traditional regulatory institutions. The datafication of finance gained momentum as financial regulators removed regulatory barriers to the movement of capital, including both laws that prevented banks from engaging in certain kinds of speculation with the funds entrusted to them and those that prevented cross-border speculation in nascent global financial markets (Arrighi 1994; Krippner 2012). Similarly, both new platform-

based work arrangements and older workforce management techniques relying on freelance and temporary labor route around many of the protections traditionally provided under labor and employment regimes to fulltime employees (De Stefano 2016). The underwriters who concocted mortgage-backed securities came to view the transaction costs imposed by local real property recording offices in the U.S. as a drag on financial innovation, and created the Mortgage Electronic Recordation System (MERS), a privatized registry. When a MERS member bank purchased a mortgage loan, it would enter MERS in the local property register as the “nominee of record” and pay the required fee just once, while MERS member banks continued to exchange the note amongst themselves in the course of successive rounds of securitization and trading (Levitin 2013). (In fact, the MERS system and its participants did not maintain good internal records, a situation that has made it nearly impossible to reconstruct chains of title for many securitized loans and the underlying real properties.)

Narratives about regulatory obstructionism and/or irrelevance are too simple, however; law and legal institutions also have played active roles in the construction of new datafied realities. Participants in the datafication of labor, land, and money have mobilized legal resources, most notably contracts law, to help create both new derivative investment instruments and new intermediation structures. Over time, some new trading strategies have become reified as financial instruments with distinct names, contours, and parameters; although contractual in origin, the new entities also have features that are property-like (Cohen 2015). Similarly, ad hoc contracting practices requiring temporary workers to disclaim many of the obligations conventionally understood as indicia of traditional employment relationships have coalesced into regularized boilerplate agreements. MERS, a creature of contract and corporations law, has pursued a litigation strategy that amounts to demanding that courts bless its unusual approach to title transfer on efficiency grounds. Practices of mortgage resale and securitization also rely on prior acceptance of the idea of negotiability—i.e., owning debt obligations as tradable assets.

The emergence of a new, fourth dematerialized factor of production—data extracted from people—has followed a similar path. Strategies directed toward cultivation, harvesting, and appropriation of personal data have catalyzed sweeping reorganizations of sociotechnical activity, and underlie the emergence of vast and lucrative new markets organized around data collection and predictive profiling. Participants in the personal data economy have constructed technical architectures and business strategies that route around the obstacles posed by privacy and data protection frameworks devised for an earlier era. Their activities both rely on and work to constitute a different type of enabling legal framework organized around the legal construct of a public domain: a repository of raw materials that are there for the taking and that are framed as inputs to particular types of productive activity (Cohen 2017). As in the cases of labor, land, and money, participants in the personal data economy also mobilize a variety of contractual tools to order their dealings with data subjects and with each other.

### *c. From Networks (and Markets) to Platforms*

The processes of datafication and appropriation described in the preceding section point toward a third dimension of the ongoing movement to informational capitalism, which is structural and organizational. In the industrial-era economy, the locus for activities of barter and exchange was the market, an idealized site of encounter between buyers and sellers within which the characteristics, quantities, and prices of goods and services were regulated autonomically by the laws of supply and demand. In the emerging informational economy, the locus for those activities is the platform, a site of encounter where interactions are materially and algorithmically intermediated. Vibrant and fast-growing literatures explore the power that platforms exert over economic exchange, social interaction, and public discourse. My goal in this section is the more modest one of teasing out the connections between platform logics and the emergent design of legal institutions for information property. As the perceived imperatives of access to data and to data processing capacity have sharpened, the platform has emerged as a key site of appropriation, and platform-driven cycles of dis- and re- intermediation have emerged as a recurring motif in information-economy narratives about competition, innovation, and access.

Over the past several decades, scholars in a wide variety of fields have identified networks and infrastructures as important organizing concepts for studying the information economy. A network is a mode of organization in which hubs and nodes structure the flows of transactions and interactions. Network organization is not a unique property of digital information and communications networks; rather, as network scientists have shown, such networks simply make visible a latent characteristic of the many human activities that rely on communication and interconnection (Barabasi 2002). Digital information and communications networks do, however, reduce many of the costs and lag times formerly associated with such activities. In addition, participants in networks reap generalized benefits, or network externalities (Katz & Shapiro 1994), as those networks grow in size and scale, and the relatively low costs of digital interconnection have enabled digital networks to become very large. Infrastructures are shared resources that facilitate downstream production of other goods (Frischmann 2012). Roads and electric power grids, for example, play essential roles as inputs into a variety of downstream goods, as do less tangible resources like linguistic and scientific conventions. Notably, infrastructures may be managed as commons but need not be: some infrastructures, such as the interbank wire transfer system, are club goods financed and controlled by their members; others, such as local electric power suppliers, are managed as utilities and financed based on metered consumption charges; and still others, including facilities for Internet access in most countries, are privately provided but subject to various regulatory obligations. Digital information and communications technologies function both as infrastructures and as networks. As scholars in fields ranging from industrial organization (Smith-Doerr & Powell 2005) to geography (Sassen 2002) to media and communications studies (Gillespie 2010; Van Dijck 2013) have shown, the forms of connectivity they provide have reshaped seemingly every area of human activity.

In some discussions of the information economy, the terms “network,” “infrastructure,” and “platform” are used interchangeably, but platforms are not the same

as networks, nor are they simply infrastructures (cf. Plantin, et al. 2016). The intertwined functions that platforms provide—intermediation between would-be counterparties and legibility of users—have important antecedents in twentieth-century direct marketing and advertising practices. In the late 1980's, as proprietary infrastructures for radio and television broadcast began to give way to a far more complex media ecosystem, the proliferation of cable channels and home video recording technologies initially caused an existential crisis for advertisers, whose aggregate measures of audience tastes began to dissolve into seemingly unmanageable fragments (Ang 1991, pp. 68-77). That fragmentation, however, also lent momentum to emerging practices of targeted marketing. At the same time, the opening of digital communications networks for commercial exploitation engendered the development of new, highly granular techniques for measuring audiences and predicting audience appeal (Bouk 2017; Turow 1997). The melding of digital architectures and commercial pressures for legibility produced a striking inversion. Twentieth-century mass-media intermediaries had purchased market research as a standalone service from third-party providers, but as legibility assumed increasing normative force as overarching frames for commercial endeavor, the legibility function began to burrow into the core of the infrastructure itself. A world with a vast diversity of information sources required intermediation, and legibility became the essential function for an intermediary to provide.

Platforms represent infrastructure-based strategies for introducing friction into networks. They are information-era formations in two distinct senses: they pursue profit strategies that revolve around information and information processing, and those strategies both rely on and reinforce the centrality of a particular set of sociotechnical predicate conditions involving networked, mediated, digital communication (Helmond 2015; Srnicek 2017). Platforms operate with the goal of making clusters of transactions and relationships stickier—sticky enough to adhere to the platform despite participants' theoretical ability to exit and look elsewhere for other intermediation options. To accomplish that goal, platforms must provide services that participants view as desirable and empowering, thereby generating and enabling participants to leverage network externalities. But they also must thwart certain other kinds of networking by developing and policing their own protocols for access. The latter power is one that the fictionalized construct of the market lacked, and it comprehensively reshapes the conditions of economic exchange.

The exchanges constituted by platforms are two- or multi-sided: they serve buyers, the sellers seeking to reach them, and often advertisers seeking the buyers' attention. Because the platform forms relationships with members of each group separately, it can define the terms of each relationship differently (Rochet & Tirole 2006). So, for example, it can charge little or nothing to participants on one side of a target market and make its profit on another side. A dominant platform can reduce prices to one group—for example, book buyers or consumers of professional networking services—below marginal cost and still maintain its dominance by charging fees to some other group, and a provider of free services to consumers can attain and maintain dominance by controlling access to the “market for eyeballs.”

From the perspective of users, a group that for purposes of this analysis includes individuals but also advertisers and niche platforms, dominant platforms in particular

function in a manner analogous to utilities, supplying basic information services now deemed essential to a wide variety of economic and social activities. Users therefore may experience platform services as both empowering and generative (Gillespie 2010). At the same time, users typically know very little about the way the intermediation provided by the platform actually works.

From the perspective of the platform, its business model instantiates both horizontal and vertical strategies for extracting the surplus value of user data. Because that goal requires large numbers of users generating large amounts of data, the platform provider's goal is to become and remain the indispensable point of intermediation for parties in its target markets (Srnicek 2017). Platforms use a variety of strategies to attain commercial success and pursue commercial dominance, including co-branding, preferential placement, and interplatform affiliation. Because the principal worry for any platform is disintermediation by a would-be competitor, however, the root strategies for competitive positioning involve preserving privileged access to data and algorithms.

### **3. Emergent Formations of Information Property: Two Stories**

In this final section of the chapter, I examine two emergent formations of information property that exist in growing tension with one another: the movement toward appropriation and enclosure of data as an economic resource and the countermovement toward construction of information commons within which appropriation and enclosure are prohibited. This exercise suggests some additional insights into the processes by which new institutions for information property first begin to take shape and the conditions that they require to flourish. In each case, new institutions for information property emerge via routine, strategic interactions between interested parties—i.e., via processes that are fundamentally performative. Parties to these interactions rely heavily on a different legal institution—contract—to define and formalize terms and conditions through which tropes of appropriation, enclosure, and secrecy are iterated and reiterated. Put differently, they are intellectual property entrepreneurs, seeking to define, propagate, and destabilize particular types of arrangements. The success or failure of these strategies depends to some extent on the content of the terms, but far more on other, contextual factors.

#### ***a. Platform-Based Property Strategies for Data***

Platform-based competitive strategies revolve fundamentally around control of access in two different and complementary senses. Platform users seek access to the essential social, commercial, and cultural connectivity that platforms provide, while platform providers seek access to the data necessary to create and sustain competitive advantage in their chosen field(s) of intermediation. The result is a bargain that appears relatively straightforward—access for data—but that in reality is complex and importantly generative. One important byproduct of these access-for-data arrangements is a quiet revolution in the legal status of data as (de facto if not de jure) proprietary informational property.

We have already seen that platform- and contract-based strategies have played a pivotal role in the dematerialization of land, labor, and money and their reconstitution as data. Platforms use contracts systematically to facilitate and protect their own legibility function, extracting transparency from users but shielding basic operational knowledge from third-party vendors, users, and advertisers alike.

The particular form of the access-for-data contract—a boilerplate terms-of-use agreement not open to negotiation—asserts a correspondingly nonnegotiable authority over the conditions of access that operates in the background of even the most generative information-economy service. Boilerplate agreements are contractual in form but mandatory in operation, and so are a powerful tool both for private ordering of behavior and for private reordering of even the most bedrock legal rights and obligations (Radin 2013). Through the terms-of-use agreement, the platform asserts “control over the surface on which the exchange takes place” (Andersson Schwarz [date], p. \_\_). The contracts themselves, of course, are “only words”—and, for that matter, words that most users do not read—but they gain powerful normative force from both their continual assertion and reassertion and their propagation within environments that use technical protocols to define the parameters of permitted behavior. The combination of asserted contractual control and technical control becomes the vehicle through which the platform imposes its own logics on the encounters that it mediates.

Commenting on the legal arrangements used to effectuate the dematerialization of labor in the informational economy, Martin Kenney and John Zysman (2016) analogize the model to the “putting out” of prefabricated pieces for assembly that occurred early in the industrial era. As anyone who has ever assembled a piece of prefabricated furniture or a modular closet system knows, piecework makes certain types of goods more widely accessible, but it is also tyrannical as to form; its component parts are intended to be assembled only in particular, predetermined ways. Boilerplate access-for-labor instruments, consumer finance contracts, and others work in tandem with platform protocols to configure land, labor, and money as modular inputs to the intermediary’s profit model.

From an intellectual property perspective, the terms-of-use agreements crafted by platforms and other information intermediaries function as points of entry for institutional entrepreneurship targeting the form and substance of legal entitlements in information. In a process that is fundamentally performative, the terms-of-use agreement steps in where the map of formal legal entitlements ends, providing a vehicle for leveraging trade secrecy entitlements into de facto property arrangements operative against large numbers of people with no direct relationship with the platform owner. In dealings with commercial counterparties, successful platforms jealously guard access to both data collected from users and the algorithms used to process the data, offering advertisers placement but never direct access to the data or algorithms themselves, offering developers access to carefully curated data sets, data structures and programming interfaces (Helmond 2015), and vigilantly policing automated crawling and data extraction by would-be competitors.

Notably, traditional intellectual property rights play helpful but secondary roles in this process of de facto proprietization, functioning as sources of leverage that can be invoked to channel would-be users toward entering the access-for-data bargain on the

platform's terms and/or to prevent would-be competitors from gaining access to information stored on the platform by other means. For example, access to a branded exchange may enable third-party vendors to position their products and services as more desirable to consumers. When access to a platform requires technical interoperability—as is the case, for example, with apps for desktop and mobile operating systems—patents and copyrights can supply important points of leverage against unauthorized access by third-party vendors and would-be platform competitors. As the example of Google shows, however, not all platform businesses consider copyrights a necessary tool for limiting access.

In sum, the access-for-data arrangement is both a concrete bargain and a complex act of institutional entrepreneurship, with a number of interrelated implications for the intellectual property system that are still playing out. In addition to their other roles, platforms are in an important sense intellectual property entrepreneurs, working to refine and propagate appropriation strategies that serve their economic interests.

### ***b. Commons vs./and/as Property Institutions***

The shift to an informational economy also has catalyzed a vibrant movement for informational commons. Formally, the label “commons” denotes an institution for resource management that is structured around nondiscriminatory sharing among the community of members (Frischmann 2012). Many different types of resources may be managed as commons, but the low costs of producing many types of information goods and distributing them via digital communications networks make possible new types of commons-based production arrangements as well (Benkler 2006). For many, the emergence of networked information and communication technologies seemed to promise a wholly new era in which cultural production by decentralized communities of peers would largely displace cultural production by the copyright industries. So far, however, although some commons movements have become well established (Creative Commons 2017; Thakker, et al. 2017), the full extent of that promise has yet to be realized.

The relationship between commons and property-based notions of exclusivity is complex and underexplored. According to one well-known definition, commons are the opposite of property in the sense that “no single person has exclusive control over the use and disposition of any particular resource in the commons” (Benkler 2006, p. 61). That formulation is compelling but also somewhat misleading. Commons is the opposite of exclusivity in the sole-ownership sense, but both arrangements are types of property institutions. Notably, institutions organized as commons may exclude nonmembers from resource access and use, and may invoke notions of property to sanction and even exclude entirely those who attempt to benefit from access without accepting the accompanying obligations.

Institutions for commons-based resource management persist over time only if their rules effectively govern members' behavior and prevent defection. For this reason, most successful examples outside the informational context involve localized resources managed by small, well-defined groups (Ostrom 1990). Within the networked digital environment, however, the same conditions that enable distributed production of

information goods also have enabled the construction of distributed institutions for commons-based management using legal instruments designed to help the terms and conditions spread virally. The two most prominent examples are the free/libre open source licensing system (F/LOSS) and Creative Commons, both self-consciously framed as efforts to develop sustainable, “copyleft” alternatives to existing copyright-based institutions. As in the case of platform-based propertization strategies, legal instruments for distributed commons-based management take the form of boilerplate restrictions that are contractual in form but mandatory in operation. As developed and pioneered by the open source software movement, this strategy was self-consciously mimetic; it relies on constructs of authorial control and take-it-or-leave-it licensing, and when challenged in court it has necessitated similar arguments about enforceability. For exactly those reasons, it has occasioned soul-searching among advocates for information commons (e.g., Dusollier 2006).

Thoughtful design and effective reiteration of narratives about boilerplate enforceability, however, are not the only determinants of success; materiality and economic organization also matter. Within both technical and cultural communities, powerful constituencies have resisted the viral spread of information commons. In the open source licensing context, persistent, thorny issues surround the interfaces between open source and proprietary systems and modules. Open-source communities have wrestled publicly with questions about how far proprietary incorporation of open modules should be allowed to proceed before triggering viral licensing provisions. In the cultural context, dominant producers of popular culture for the most part do not wish to relinquish control over their products to the full extent demanded even by the most protective versions of the Creative Commons license. Because cultural network effects are weaker than coded interoperability protocols, the Creative Commons model has been incapable of compelling viral spread in the same manner and to the same extent as the open source licensing model has done.

Both the open source licensing movement and the Creative Commons movement also confront other ongoing challenges rooted in the material logics of the platform-based economy. As discussed previously, although networked digital communications infrastructures do enable distributed peer production, they also are highly configurable. Therefore, they have proved well-suited to strategies of reorganization, appropriation, and enclosure by platform-based business models. The shift toward platform-based organizational logics has implications for both technical and cultural production. Most obviously, platform logics facilitate efforts to control flows of proprietary cultural content; for example, dedicated platforms like Netflix or Hulu need not carry Creative Commons content, and zero-rating initiatives by access providers can effectively deprioritize such content. Open source software has attained a more durable foothold, but access-control strategies based on patenting, on copyright control of application programming interfaces, and on digital rights management tend to be implemented in ways that are incompatible with the open source ethos. Platform logics also have implications for new initiatives based on open content and/or data; such efforts sometimes have found themselves confronting appropriation and enclosure after taking root in user communities (Pessach 2016).



A final set of complications confronting movements for information commons is political, and flows from the fact that commons and users' rights are not equivalent. As noted above, institutions designed as commons do not inevitably afford their members open-ended grants of users' rights. This is easiest to see in the case of commons that are constituted for the benefit of particular, well-defined groups, such as the grazing and water rights collectives studied by Ostrom (1990). In such institutions, the parameters of permitted access and use are strictly defined. Even in more widely dispersed commons regimes, however, users may not ignore the rules established by the governing institutions for those regimes. For example, someone who wants to violate the rules of an open source license will not be able to rely on his or her license for permission, but will need to mount a challenge based on the background copyright law. Users' rights, meanwhile, generally are conceptualized as limited exceptions for personal private use that must be claimed on a case by case basis, rather than as common privileges automatically available to all.

These differences between commons and users' rights have created both political fragmentation and moral hazard. Movements organized around users' rights, and particularly around peer-to-peer file-sharing and open entertainment platforms, have struggled to earn the approval of courts and policymakers. Many such movements now are explicitly framed as counter-movements in a way that many of the most high-profile and successful commons movements are not. Meanwhile, the copyleft movements' deliberate reliance on the anti-radical rhetorics of authorial choice (in the case of Creative Commons) and business-friendly utility (in the case of some, though not all, open source communities) have been important factors enabling them to take root and flourish. The result is that users' rights groups and commons movements do not always speak with a unified voice in copyright reform debates, a situation that has made the most lasting reforms advocated by both groups more difficult to achieve.

## V. Conclusion

Information property institutions are not neutral tools for welfare maximization, as many economists and economically-inclined legal scholars would have it, nor are they simply instrumentalities of hegemonic control, to paraphrase an oft-repeated refrain in media studies and critical legal studies. They play central roles in the evolving articulation of informational capitalism as a system of political economy, and in so doing they shape the evolution of both media content and media infrastructures. At the same time, however, the evolution of informational capitalism calls forth new propertization strategies and channels those strategies in particular ways. The examples of appropriated data flows and information commons illustrate two very different paths that process has taken.

## References

- Andersson Schwarz, Jonas. [2016]. "Platform Logic: The Need for an Interdisciplinary Approach to the Platform Economy." [working paper; need placement info].
- Ang, Ien. 1991. *Desperately Seeking the Audience*. New York: Routledge.

- Arrighi, Giovanni. 1994. *The Long Twentieth Century: Money, Power, and the Origins of Our Times*. New York: Verso.
- Barabasi, Albert-Laszlo. 2002. *Linked: The New Science of Networks*. Cambridge, Mass.: Perseus Publishing.
- Beebe, Barton. 2010. "Intellectual Property Law and the Sumptuary Code," *Harvard Law Review* 123(4): 809-889.
- Benkler, Yochai. 1999. "Free as the Air to Common Use: First Amendment Constraints on the Enclosure of the Public Domain." *New York University Law Review* 74(2): 354-446 (1999).
- Benkler, Yochai. 2002. "Intellectual Property and the Organization of Information Production." *International Review of Law and Economics* 22(1): 81-107.
- Benkler, Yochai. 2006. *The Wealth of Networks*. New Haven: Yale University Press.
- Bettig, Ronald V. 1996. *Copyrighting Culture: The Political Economy of Intellectual Property*. Boulder, Colo.: Westview Press.
- Boczkowski, Pablo J. & Siles, Ignacio. 2014. "Steps Toward Cosmopolitanism in the Study of Media Technologies: Integrating Scholarship on Production, Consumption, Materiality, and Content," in Tarleton Gillespie, Pablo J. Boczkowski, & Kirsten A. Foot, eds., *Media Technologies, Essays on Communication, Materiality, and Society*, pp. 53-76. Cambridge, Mass.: MIT Press.
- Bouk, Dan. [2017 forthcoming]. "The History and Political Economy of Personal Data over the Last Two Centuries in Three Acts." *Osiris* \_\_\_\_():\_\_\_\_.
- Boyle, James A. 1998. *Shamans, Software, and Spleens: Law and the Construction of the Information Society*. Cambridge, Mass.: Harvard University Press.
- Brummer, Chris. 2015. "Disruptive Technology and Securities Regulation." *Fordham Law Review* 84(3): 977-1052.
- Burk, Dan L. 2016. "On the Sociology of Patenting," *Minnesota Law Review* 101(2): 421-452.
- Castells, Manuel. 1996. *The Rise of the Network Society*. New York: Wiley-Blackwell.
- Chiu, Iris H.-Y. 2016. "Fintech and Disruptive Business Models in Financial Products, Intermediation and Markets: Policy Implications for Financial Regulators." *Journal of Technology Law and Policy* 21(1): 55-112.
- Chon, Margaret. 2006. "Intellectual Property and the Development Divide," *Cardozo Law Review* 95(2): 2821-2912.
- Cohen, Julie E. 2012. *Configuring the Networked Self: Law, Code, and the Play of Everyday Practice*. New Haven: Yale University Press.
- Cohen, Julie E. 2015. "Property as Institutions for Resources: Lessons from and for IP," *Texas Law Review* 94(1): 1-57.
- Cohen, Julie E. 2017. "The Biopolitical Public Domain: The Legal Construction of Informational Capitalism," *Philosophy and Technology*; <http://dx.doi.org/10.1007/s13347-017-0258-2>
- Cohen, Julie E. [forthcoming]. *Between Truth and Power: The Legal Construction of Informational Capitalism*. New York: Oxford University Press.
- Coleman, E. Gabriella. 2013. *Coding Freedom: The Ethics and Aesthetics of Hacking*. Princeton: Princeton University Press.

- Coombe, Rosemary. 1998. *The Cultural Life of Intellectual Properties: Authorship, Appropriation, and Law*. Durham, N.C.: Duke University Press.
- Creative Commons. 2017. "State of the Commons 2016," <https://stateof.creativecommons.org/>.
- De Stefano, Valerio. 2016. "The Rise of the 'Just-in-Time' Workforce: On-Demand Work, Crowdwork, and Labor Protection in the 'Gig-Economy,'" *Comparative Labor Law and Policy Journal* 37(\_): 471-504.
- Desai, Deven R. 2012. "From Trademarks to Brands." *Florida Law Review* 64(4): 981-1044.
- Dusollier, Severine. 2006. "The Master's Tools v. the Master's House: Creative Commons v. Copyright," *Columbia Journal of Law and the Arts* 29(3): 101-123.
- Epstein, Richard. 2011. "What Is So Special About Intellectual Property? The Case for Intelligent Carryovers," in Geoffrey D. Manne & Joshua D. Wright, eds., *Competition Policy and Patent Law Under Uncertainty: Regulating Innovation*, pp. 42-74. New York: Cambridge University Press.
- Fennell, Lee Anne. 2013. "The Problem of Resource Access," *Harvard Law Review* 126: 1471-1531.
- Frischmann, Brett M. 2012. *Infrastructure: The Social Value of Shared Resources*. New York: Oxford University Press.
- Frischmann, Brett M. & Mark A. Lemley. 2007. "Spillovers," *Columbia Law Review* 107(1): 257-302.
- Frischmann, Brett M., Madison, Michael J., and Strandburg, Katherine J. 2014. *Governing Knowledge Commons*. New York: Oxford University Press.
- Gillespie, Tarleton. 2007. *Wired Shut: Copyright and the Shape of Digital Culture*. Cambridge, Mass.: MIT Press.
- Gillespie, Tarleton. 2010. "The Politics of 'Platforms,'" *New Media & Society* 12(3): 347-364.
- Gordon, Wendy J. "A Property Right in Self-Expression: Equality and Individualism in the Natural Law of Intellectual Property." *Yale Law Journal* 102(7): 1533-1609.
- Gray, Jonathan, Sandvoss, Cornel, & Harrington, C. Lee. 2007. *Fandom: Identities and Communities in a Mediated World*. New York: New York University Press.
- Helmond, Anne. 2015. "The Platformization of the Web: Making Web Data Platform Ready," *Social Media and Society*, doi: 10.1177/2056305115603080.
- Herman, Bill D. 2013. *The Fight Over Digital Rights: The Politics of Copyright and Technology*. New York: Cambridge University Press.
- Holt, Douglas B. 2004. *How Brands Become Icons: The Principles of Cultural Branding*. Cambridge, Mass.: Harvard Business School Press.
- Jaszi, Peter. 1994. "On the Author Effect: Contemporary Copyright and Collective Creativity," in Martha Woodmansee & Peter Jaszi, eds., *The Construction of Authorship: Textual Approaches in Law and Literature*, pp. 29-56. Durham, N.C.: Duke University Press.
- Kalleberg, Arne L. 2009. "Precarious Work, Insecure Workers: Employment Relations in Transition," *American Sociological Review* 74(Feb.): 1-22.
- Katz, Michael L. & Carl Shapiro. 1994. "Systems Competition and Network Effects." *Journal of Economic Perspectives* 8(2): 93-115.

- Kelty, Christopher M. 2008. *Two Bits: The Cultural Significance of Free Software*. Durham, N.C.: Duke University Press.
- Kenney, Martin & Zysman, John. 2016. "The Rise of the Platform Economy." *Issues in Science and Technology* 32(3): 61.
- Krippner, Greta. 2012. *Capitalizing on Crisis: The Political Origins of the Rise of Finance*. Harvard: Harvard University Press.
- Landes, William M. & Posner, Richard A. 2003. *The Economic Structure of Intellectual Property Law*. Cambridge, Mass.: Harvard University Press.
- Lessig, Lawrence. 1998. *Code and Other Laws of Cyberspace*. New York: Basic Books.
- Levitin, Adam J. 2013. "The Paper Chase: Securitization, Foreclosure, and the Uncertainty of Mortgage Title." *Duke Law Journal* 63(3): 637-734.
- Levitin, Adam J. [2017 forthcoming]. "Pandora's Digital Box: The Promise and Perils of Digital Wallets," *University of Pennsylvania Law Review* 166(\_): \_\_\_\_.
- Levitin, Adam J. & Wachter, Susan M. 2012. "Explaining the Housing Bubble." *Georgetown Law Journal* 100(4): 1177-1258.
- Lievrouw, Leah A. 2014. "Materiality and Media in Communication and Technology Studies: An Unfinished Project," in Gillespie, et al., eds., *Media Technologies* 21-52.
- Litman, Jessica. 1989. "Copyright, Compromise, and Legislative History." *Oregon Law Review* 68(2): 275-362.
- Litman, Jessica. 2001. *Digital Copyright*. Amherst, NY: Prometheus Books.
- McDonagh, Luke. 2015. "From Brand Performance to Consumer Performativity: Assessing European Trademark Law After the Rise of Anthropological Marketing," *Journal of Law and Society* 42(4): 611-638.
- McKenna, Mark P. 2007. "The Normative Foundations of Trademark Law," *Notre Dame Law Review* 82(5): 225-294.
- Merges, Robert P. 2000. "One Hundred Years of Solicitude" Intellectual Property Law, 1900 - 2000." *California Law Review* 88(6): 2187-2240.
- Ostrom, Elinor. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. New York: Cambridge University Press.
- Parchomovsky, Gideon & Wagner, R. Polk. 2005. "Patent Portfolios." *University of Pennsylvania Law Review* 154(1): 1-78.
- Pessach, Guy. 2016. "Beyond IP—The Cost of Free: Informational Capitalism in a Post IP Era," *Osgoode Hall Law Review* 54(1): 225-251.
- Plantin, Jean-Christophe, Lagoze, Carl, Edwards, Paul N., & Sandvig, Christian. 2016. "Infrastructure Studies Meet Platform Studies in the Age of Google and Facebook." *New Media and Society*, doi: <https://doi.org/10.1177/1461444816661553>
- Polanyi, Karl. 1957. *The Great Transformation: The Political and Economic Origins of Our Time*. Boston: Beacon Press.
- Radin, Margaret Jane. 2013. *Boilerplate: The Fine Print, Vanishing Rights, and the Rule of Law*. Princeton, NJ: Princeton University Press.
- Rochet, Jean-Charles & Tirole, Jean. 2006. "Two-Sided Markets: A Progress Report." *RAND Journal of Economics* 37(3): 645-667.
- Sassen, Saskia, ed. 2002. *Global Networks, Linked Cities*. New York: Routledge.

- Schiller, Dan. 2007. *How to Think About Information*. Urbana: University of Illinois Press.
- Scholz, Trebor. 2017. *Uberworked and Underpaid: How Workers Are Disrupting the Digital Economy*. New York: Polity Press.
- Schur, Richard D. 2009. *Parodies of Ownership: Hip-Hop Aesthetics and Intellectual Property Law*. Ann Arbor: University of Michigan Press.
- Servon, Lisa. 2017. *The Unbanking of America: How the Middle Class Survives*. New York: Houghton Mifflin Harcourt.
- Silbey, Jessica. 2015. *The Eureka Myth: Authors, Innovators, and Everyday Intellectual Property*. Stanford: Stanford University Press.
- Singer, Joseph. 2011. "Property Law as the Infrastructure of Democracy," in Michael Allen Wolf, ed., *Powell on Real Property*, pp. 11-1 to 11-17. New Providence, NJ: Lexis-Nexis Publishing.
- Smith, Henry E. 2007. "Intellectual Property as Property: Delineating Entitlements in Information." *Yale Law Journal* 116(\_): 1742-1822.
- Smith-Doerr, Laurel & Powell, Walter W. 2005. "Networks and Economic Life." In Neil J. Smelser & Richard Swedberg, eds., *The Handbook of Economic Sociology*, 2d ed., pp. 379-401. Princeton: Princeton University Press.
- Srnicek, Nick. 2017. *Platform Capitalism*. Malden, Mass.: Polity Press.
- Standing, Guy. 2011. *The Precariat: The New Dangerous Class*. London: Bloomsbury.
- Thakker, Dharmesh, Schireson, Max, & Nguyen-Ha, Dan. 2017. "Tracking the Explosive Growth of Open-Source Software," *TechCrunch*, Apr. 17, 2017, <https://techcrunch.com/2017/04/07/tracking-the-explosive-growth-of-open-source-software/>.
- Turow, Joseph. 1997. *Breaking Up America: Advertisers and the New Media World*. Chicago: University of Chicago Press.
- Tushnet, Rebecca. 2015. "Stolen Valor and Stolen Luxury: Free Speech and Exclusivity." In Haochen Sun, Barton Beebe, and Madhavi Sunder, eds., *The Luxury Economy and Intellectual Property: Critical Reflections*, pp. 121-143. New York: Oxford University Press.
- Van der Zwan, Natascha. 2014. "Making Sense of Financialization." *Socio-Economic Review* 12: 99-129.
- Van Dijck, Jose. 2013. *The Culture of Connectivity: A Critical History of Social Media*. New York: Oxford University Press.