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Chapter 1

Everything Old Is New Again—Or Is It?

“We’ve changed our internal motto from ‘Move fast and break things’ to ‘Move fast with stable infrastructure.’”

– Mark Zuckerberg, Remarks at F8 Developer Conference, April 2014

To understand the emergence of the informational economy and the role of legal entitlements in facilitating it, it is instructive to begin by looking backward. Among economic historians, a useful frame for understanding the emergence of industrial capitalism is Karl Polanyi’s analysis of a “great transformation” in the system of political economy that involved appropriation of newly important 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.” Both developments lent momentum and legitimacy to the resource-directed activities about which so much has been written—large-scale enclosures of land, displacement of populations, extraction of natural resources, and construction of factories. Together, those 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 protective countermovement aimed at ameliorating their effects.¹

Extending the analytical frame and the metaphor of the double movement, this chapter frames the emergence of informational capitalism in terms of three large-scale shifts that together constitute the movement toward informational capitalism: the propertization (or enclosure) of intangible resources, the dematerialization and datafication of the basic factors of industrial production, and the embedding (and rematerialization) 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.

This chapter sketches the ongoing processes of propertization, datafication, and platformization, with particular attention to the shifting, emergent relationships between control of intangible intellectual resources and political economy. First, it traces the evolution of modern regimes of intellectual property protection, identifying a series of profound changes that relate to both imagined justifications and patterns of exploitation and use. Second, it explores some of the ways that the basic factors of industrial production identified by Polanyi—labor, land, and money—are becoming dematerialized and datafied to facilitate their more efficient exploitation. Finally, it interrogates the ongoing shift from a market-based economy to a platform-based economy, identifying ways in which that shift has begun to reshape both the nature of informationalized

production and understandings of information ownership. Laying bare the key structural elements of the movement to an informational economy underscores both the facilitative role of law and the extent to which the landscape of legal entitlements in information is in motion.

Capital without Industry?

At the most general level, an informational economy is one oriented principally toward the production, accumulation, and processing of information, but that description leaves substantial room for debate over the rules governing control of informational resources. Legal scholars have waged heated debates about intellectual property's optimal contours and essential characteristics. My concern here is with historical and material contingencies rather than metaphysical essentials. This section describes important trends in the evolution of formal legal entitlements in intellectual property from the mid-twentieth century through the present. As we will see, the movement to an informational political economy has both relied on and reshaped the legal rules governing propertization of intangible intellectual goods. Information-era intellectual property rights, both old and new, have evolved in ways that reproduce and deepen existing patterns of control over and concentration of capital. The changes have entailed corresponding shifts in prevailing narratives about both ownership of intangible production and the kinds of rights that ownership confers.

Production Values

In the pantheon of intellectual property rights, the grandest rights are patents and copyrights, which are designed—or so the story goes—to motivate and reward individual inventors and creators. From the beginning of the modern era, however, 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. As the movement to an informational economy has gathered speed, new strands of justification have begun to emerge that emphasize the claims of intermediaries more directly. The ever-increasing primacy of production intermediaries also has produced deeper shifts in the ways that rightholders describe, understand, and exploit patents and copyrights, which relate to appropriation strategies, methods of valuation, and mechanisms for ensuring access to certain types of persistently individualized inputs.

Some of the reasons for the primacy of production intermediaries within the industrial-era patent and copyright systems were technological and some were organizational. Industrial firms with access to capital assembled the research teams and the material resources needed to solve large-scale technical problems and built the production and transit facilities 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. Dissemination of creative outputs required access to printing presses, newsstands and bookstores, movie theaters, or broadcast airwaves.

Terminology in the creative industries came to reflect the reality of intermediated creative production; so, for example, in some circles it became customary to describe cultural goods in terms of production values. Even today, production intermediaries can perform well some tasks—such as marketing and promotion—that most creators themselves perform very poorly.

Unsurprisingly, the patent and copyright regimes that evolved in the United States beginning in the late nineteenth century were increasingly optimized for facilitating industrial processes of intangible intellectual production. One important set of developments concerned corporate ownership of intellectual creations. Although neither the Patent Act nor, initially, the Copyright Act gave employers rights to their employees' creations, judge-made rules developed to validate corporate practices of asserting ownership over employee-created inventions and creative works. Strands of state tort and contract law coalesced into trade secrecy doctrines providing that those who employed people for “inventive” duties owned the resulting inventions; that default rule, in turn, made subsequent assignment of any issued patents to one's employer ordinary and expected.² Courts in copyright cases involving employers reasoned that authorship of commissioned works should flow to the party that had assumed the economic risk. The 1909 revision of the Copyright Act codified copyright's emergent work-made-for-hire conventions, and the 1976 revision added a series of detailed provisions covering works commissioned from certain types of freelancers.³

Other developments altered the scope of patents and copyrights in ways that favored powerful new industries. Courts rejected a longstanding rule allowing competitors to exploit “unworked” patents in exchange for a reasonable royalty, clearing the way for corporate patent owners to amass portfolios of patents and make unilateral decisions about their use or nonuse. The 1952 revision of the Patent Act rejected various judicially developed limitations on patentability; eliminated uncertainties about the patentability of improvements to existing inventions and of methods combining well-known materials and steps; and defined patent rights in a way that ratified the use of blocking patents as bargaining chips.⁴ On the copyright side, a series of statutory amendments extending over the course of the century vastly extended the duration of both future and already-subsisting copyrights and expanded the scope of copyright protection to cover the byproducts of new recording and broadcast technologies. The 1976 revision of the Copyright Act contained broad, general rights and narrow, specific limitations, eliminating the latitude that formerly had existed for many nonprofit and downstream uses of copyrighted works. It also codified for the first time a broad right to control preparation of so-called derivative works based on or adapted from other works.⁵

The increasingly pronounced statutory and doctrinal orientation toward industrial production and distribution of intangible intellectual goods accounts for the strange dual quality of the rhetoric in debates about intellectual property policy. Legal scholars have disagreed about whether romantic creatorship or economic instrumentalism is the dominant strand in that narrative, and about the goodness of fit between both justifications and the actual practices of individual creators and creative communities. Those disagreements, however, often overlook the way that desert-based and instrumentalist narratives began to work together to bolster a particular regime of legal

protection for intangibles that relied on and reinforced the role of capital in underwriting intellectual production.⁶

Twentieth-century debates about intellectual property policy also reveal a gradual shift in the tenor of the instrumentalist justification for granting patents and copyrights. Whereas nineteenth-century rhetoric had emphasized the public and democratic benefits to be gained from underwriting progress in science and learning, the distinctive flavor of instrumentalism that developed beginning in the mid-twentieth century focused more narrowly on incentives to production. The emergence and rapid ascendancy of Chicago-School neoclassical economic analysis, which emphasized the role of individual choice, accelerated the turn to incentive-based reasoning. It also 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.⁷ 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. Industry associations that used to bring individual authors to testify before Congress now send their own officials, who make arguments about distribution incentives, trade balances, and gross national product.⁸ The Supreme Court has cited both the argument from intermediary incentives and the argument from trade as ineluctable realities.⁹

As intellectual property rhetoric has evolved to emphasize the primacy of corporate claims, deeper conceptual and structural changes in the patent and copyright systems have been underway. Although individual patents and copyrights remain the theoretical basic units of protection, intellectual property law's formal atomism belies some of the ways that the foundations for the industrial organization of cultural and technical production have shifted to facilitate amassing intangible capital at scale. Because many intangible assets are most valuable when exploited in combination, large rightholders now routinely and deliberately amass strategic portfolios of intangible assets.¹⁰ Portfolio-based intellectual property strategies in turn exert ripple effects on both judge-made doctrines and customary practice. So, for example, courts initially were reluctant to recognize copyrights in any but the most central literary characters, worrying that such copyrights would work to the detriment of authors who had assigned their copyrights to publishers. Today, however, character copyrights are cornerstones of merchandising campaigns that extend across movie and television franchises, and the test for character copyrightability has evolved to facilitate the coordinated exploitation of entertainment properties that extend over multiple works.¹¹ A patent grant requires disclosure sufficient to enable a person ordinarily skilled in the art to practice the claimed invention. Courts interpreting the enablement requirement have framed the conceptualization of the person ordinarily skilled in the art in a way that permits drafters in certain industries to practice systematic vagueness, and firms also have learned to practice selective, patent-preempting disclosure in ways that both strengthen their own portfolio positions and disadvantage their competitors.¹²

Meanwhile, the perceived need for comprehensive and consistent methods of defining and valuing legal entitlements in intangible intellectual goods has begun to reshape entire areas of business-related law: What is the best way to express the effects

of patents and research programs on stock prices—and what disclosures should securities regulators therefore require? Are there alternative avenues for capitalization that do not require comparable levels of disclosure about intellectual property-in-the-making? What is the appropriate basis for taxation of intangible intellectual assets, and where geographically should those assets be deemed to reside for tax purposes? How can intangible intellectual assets and portfolios of those assets be collateralized, and how should such assets be valued in bankruptcy proceedings? How should the risk of infringement liability affect insurance availability and pricing?¹³ Each of those legal fields, moreover, values certainty and predictability in asset definition, and that overarching need shapes the way firms assert intellectual property claims, disfavoring doctrines perceived as vague and uncertain. The repeated, self-interested assertion of positions aimed at minimizing uncertainties has begun to produce doctrinal shifts. So, for example, many fair use disputes have become disputes about the weight to be given to norms and practices favoring licensing. Courts in patent obviousness disputes have developed ancillary tests that emphasize commercial success and diminish the likelihood of an “obvious to try” finding; and the doctrine of equivalents plays a much less significant role in the patent infringement litigation landscape.¹⁴

Last and importantly, secondary intermediaries that perform market-clearing functions have become increasingly crucial to information-economy activities. Many uses of intangible intellectual goods are cumulative or fractional (or both). Despite the increasing efficacy of techniques for asserting corporate authorship or ownership of intellectual goods, some types of creative production—in particular, photography, sculpture, and musical composition—remain persistently individualized. Others inevitably aggregate content from multiple corporate sources. For example, clips from news programs and popular audiovisual works appear as featured or background material in documentary and feature films; public performance rights in popular songs are licensed for synchronization with films, television programs, and advertisements; and photographs and other visual artworks may appear in advertisements or in the promotional materials for corporations and other organizations. On the technical side, some types of production inevitably rely on the contributions of many firms and research labs. Operating systems for personal computers and mobile devices implicate thousands upon thousands of patents. Correspondingly, collective rights management institutions such as patent pools, technical standards bodies, performing rights organizations, and organizations that grant reproduction “clearances” play central roles in mediating access to and use of intangible resources.¹⁵

Brand Values

Within the traditional hierarchy of intellectual property rights that emerged over the nineteenth and early twentieth centuries, trademarks were inferior rights. Nineteenth century courts and commentators understood trademark law as providing a narrow, limited form of protection for existing commercial goodwill.¹⁶ The enactment of federal trademark legislation in the United States in 1905, followed by the more comprehensive and modern Lanham Trade-Mark Act of 1946, responded to the emergence of a nationwide manufacturing economy within which the meaning of marks of origin as signifiers of corporate reputation was no longer only local.¹⁷ Even as Congress was moving to federalize limited statutory protection for trademarks as signals of commercial

goodwill, however, brands and branding had begun to assume a very different, overtly persuasive function. As the movement to an informational economy has gathered speed, the expressive power of corporate brands has continued to grow in importance, and legal protection for trademarks and brands has grown increasingly broad.

The growing prominence of brands and branding during the first half of the twentieth century reflected both the proliferation of mass-manufactured, prepackaged goods and the efforts of the nascent marketing industry. Early in the twentieth century, marketers' influence already had begun to shape both print media content and the structure of print media markets, producing content and accompanying advertisements that were self-consciously designed to appeal to a particular readership.¹⁸ Information about tastes was rudimentary and incomplete, however, and in any case marketers sought not only to understand tastes but also to shape them. Attention to branding was a logical extension of the drive to reach and retain desired consumers. As nationwide mass media markets and technologies evolved and consumption boomed in the prosperous postwar decades, however, class-based models of expected consumer behavior began to give way to lifestyle-based and motivational approaches, and marketers sought more overtly not only to inform but also to persuade.¹⁹

In more recent decades, persuasive branding strategies have evolved in ways that both reflect and offset the increasingly informationalized nature of consumer goods and services. Tension between persuasion and informational opacity is an endemic feature of many information-economy markets—think, for example, of the lengthy lists of artificial ingredients on processed food packages and the turgid-yet-alarming disclaimers that accompany over-the-counter pharmaceutical products. Effective branding can convey, for example, low-fat or non-drowsy or eco-friendly properties—and can obfuscate other, more complex considerations bearing on consumption decisions. In developed economies, many consumer electronic devices and associated services have begun to approach commodity status, and branding strategies have become important vehicles for differentiating functionally identical offerings and crafting appeals to different market segments. (Dell Computer's pink-themed "Della" website, supposedly geared toward the unique computing needs of women, is a memorable reminder that the latter strategy can backfire hilariously.)²⁰

For consumers on the receiving end of these 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.²¹ Those systems reflect the deliberate efforts of marketers who seem to have internalized the core tenets of post-structuralist thought about the cultural construction of identity and meaning. Contemporary marketers devise endlessly inventive ways of reaching eyeballs and attention, and understand their own mission as a type of applied anthropology.²²

Modern trademark policy's engagement with the evolving purposes and practices of branding has been uneven. Mid-century commentators on trademarks and trademark law were keenly aware of the increasing power of commercial persuasion, but seemed unsure what, if anything, trademark law ought to do about it.²³ At the same time, the mid-

century emergence of Chicago School economic reasoning worked to bolster the emerging “search costs” justification for trademark protection. According to that justification, trademarks facilitate signaling about product quality. Consumers looking to distinguish among the goods and services offered by different providers can learn to recognize their trademarks, and over time (or so the account goes) can rely on those marks as indicia of consistency. Legal protection for trademarks therefore facilitates efficient markets.²⁴

The result, as many contemporary scholars have noted, is a fairly significant disconnect between what marks do and what leading doctrinal and instrumental accounts of trademark law say they do. As Barton Beebe puts it, modern trademark law fulfills many of the functions of a sumptuary code, effectively regulating performances of status.²⁵ Trademark law’s official narratives are different and far less attentive to branding’s cultural purposes and effects. The statutory structure of trademark law also militates against direct acknowledgement of the purposes and practices of branding. As is the case with patent law and copyright law, trademark and unfair competition law is formally atomistic. Within the legal framework established by the Lanham Act, the basic unit of protection for brand reputation nominally remains the individual mark. Federal registration is available only for specific marks, and causes of action for infringement must be pleaded on a mark-specific basis.

At the same time, though, case law interpreting the Lanham Act’s “likelihood of confusion” standard has given trademarks’ presumptive claims on consumer thought processes broader and broader scope. So, for example, although courts and commentators initially thought that trademarks reproduced on logo merchandise served purely aesthetic and hence nontrademark 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.²⁶ 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 novel theory of “post-sale confusion,” or cognitive dissonance resulting from the mismatch between luxury signifier and down-market context.²⁷

In parallel with these judicially-driven developments, business communities have developed robust conventions for valuing both marks and brands.²⁸ And, as for patents and copyrights, new approaches to valuation have engendered doctrinal ripples. Strict rules barring so-called “naked licensing”—licensing without oversight for quality control—and prohibiting transfers of marks without the accompanying goodwill have been relaxed, allowing complex webs of franchising, merchandising, and co-branding to flourish.²⁹ In disputes about the use of trademarks as search terms, corporate interests lost some battles but won the war; search has been pervasively monetized in ways that reward brand owners with revenue rather than with exclusivity.³⁰

Meanwhile, supplementary entitlements in brands have proliferated in ways that tacitly acknowledge and reinforce the expressive power of capital. The general cause of action for unfair competition, originally intended to provide much narrower protection,

now functions as a catch-all that is routinely recruited to cover a wide variety of situations implicating brands rather than particular marks. In particular, legal protection for trade dress—originally understood to mean specific elements of packaging associated with a product or service—has continued to expand and now provides broad protection for the “look and feel” of products, services, and even business establishments.³¹ As we will see next, that expansion is part of a broader shift toward a more diverse and differentiated landscape of intangible intellectual property entitlements.

New (and Old) Legal Hybrids

The story of trademark law’s evolution hints at a third essential strand in the story of intellectual property’s evolution in the era of informational capitalism. As intangible intellectual goods have become more varied, more important, and potentially more profitable, the carefully delineated intellectual property taxonomies that originated in an earlier era have come to seem increasingly inadequate. New types of entitlements—some legislatively decreed and others judicially invented—have mushroomed around the edges of existing entitlement schemes, blurring their borders and extending their reach. With them have come heated legal battles about whether the traditional taxonomies represent sacred canons or outmoded constraints. For the most part, the new legal hybrids are winning those battles.³²

One important constellation of new rights works to protect the cognitive and affective capital that brand owners have developed. Congress has supplemented the traditional trademark and unfair competition prohibitions against deceptive or confusing conduct in commerce with additional protections against dilution, tarnishment, and cybersquatting. Only owners of “famous” marks can invoke the anti-dilution and anti-tarnishment provisions, a rule that sets up a rich-get-richer dynamic benefiting the most well-known marks.³³ The anti-cybersquatting statute, which provides remedies that are theoretically accessible to all mark-holders, represents a concerted attempt to realign ownership of internet domains with ownership of brands.³⁴

Firms seeking broader protection for the design of their products than modern copyright or trademark law can provide have rediscovered a type of intellectual property right that is very old. Copyright protects product design only to the extent that expressive aspects can be separately identified, but design patent protection applies much more broadly. Formerly an obscure backwater of the patent system, the office that handles design patent applications has seen its business surge to record levels, nearly doubling as a percentage of utility patent applications and more than doubling as a percentage of utility patent grants.³⁵ The courts have responded to the upsurge of interest by defining the standard for infringement downward. Together, copyright law, trademark law, and design patent law regimes are coalescing to produce a powerful new “law of look and feel” for the outputs of industrial designers.³⁶

Meanwhile, new federal legislation has both reinforced and expanded trade secrecy protections formerly available only under state law. The Economic Espionage Act of 1996 authorized federal criminal prosecution for certain knowing misappropriations of valuable information. The Defend Trade Secrets Act of 2016 completed the federalization of trade secrecy law by conferring private rights of action on those harmed and authorizing civil seizures of items embodying misappropriated

knowledge.³⁷ The federal Computer Fraud and Abuse Act also has been deputized as a tool for protecting corporate entities' interests in controlling access to their systems and networks. Lawsuits over data scraping from publicly available websites have proliferated, and prosecutions and civil suits against defecting employees for using their credentials to gain "unauthorized access" to system resources also have become principal uses of the statute.³⁸

Still other new statutory entitlements supplement the patent and copyright regimes in circumstances involving publicly distributed products that trade secrecy cannot protect. The regulatory disclosures required to bring certain types of biomedical and biotechnology innovations to market work at cross purposes to strategies based on secrecy. Instead, a small cluster of new entitlements has begun to emerge in the domains of biotechnology and biomedicine that expand the window of exclusivity for patented products facing competition from generics.³⁹ In the domain of copyright, new statutory protections against "circumvention" of copy-protection technologies provide digital works with an extra layer of protection against copying and also work to shield proprietary media platforms against unauthorized access.⁴⁰

Efforts by intellectual property scholars and activists to stem the expansion and proliferation of intangible intellectual entitlements have been notably ineffective. In amicus briefs, position papers, and law review articles, opponents of expansion and proliferation have offered two very different types of arguments. Some defend the existing boundaries by reference to tradition and originalist understanding, while others argue that continued expansion and proliferation of intangible intellectual entitlements will undermine both competition and continued innovation.⁴¹ Those in the latter group, however, have been unable to marshal substantial empirical evidence to support claims that sound fundamentally in empiricism. History supplies many examples of intellectual property granted or expanded and fewer of protection withheld or narrowed, and assertions resting on counterfactual premises can be difficult to prove.⁴² Equally important, the two types of arguments are difficult to synthesize into a coherent narrative. Arguments from tradition seem willfully blind to the realities of the contemporary networked information economy, while normative claims that prioritize innovation work at cross purposes with arguments from tradition. It is unsurprising, then, that opponents of intangible entitlements' expansion and proliferation have been unable to disrupt the powerful syllogism linking propertization with increased progress.

Labor, Land, and Money Reimagined

Two seeming exceptions to the narrative of intellectual property expansion and reconceptualization are data and algorithms—perhaps the paradigmatic information-era resources. Despite repeated efforts over the course of the twentieth century, both data and algorithms have proved powerfully resistant to formal propertization.⁴³ 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 datafied inputs to new algorithmic modes of profit extraction. At the same time, data and algorithms have become the subjects of active appropriation strategies—strategies that represent both economic and legal entrepreneurship.

New business models based on old resources often are labeled disruptors because of their effects on the economic, social, and legal arrangements that had coalesced around the older models. Notably for my purposes in this book, many of the legal arrangements now under threat trace their origins to Polanyi’s protective countermovement. Disruptive business models route around the modern versions of the regulatory constraints put in place to mitigate the harshest consequences of commodification for human societies. Contemporary processes of datafication therefore have ramifications for human wellbeing as profound as those Polanyi chronicled in an earlier era. The regulatory mechanisms may have become obsolete, but the regulatory goals of the earlier countermovement remain profoundly relevant today, and I return to them in Part II.

This chapter, however, is concerned with emergent dynamics of propertization, and as we will begin to see in this section, law is not just something that bites on new business models after the fact. While debates about the legal status of data and algorithms as property have been frozen in stalemate, the landscape of de facto appropriation and enclosure is in rapid and productive motion. Processes of datafication supply inputs for new processes of intellectual property entrepreneurship, and participants in those processes are mobilizing law and legal institutions to help them reconfigure labor, land, and money in the formats they require.

Money without Investment

In financial markets, processes of dematerialization and informationalization have been underway since early in the twentieth century. Money—a medium of exchange that is valuable only for what it represents—is an inherently abstract construct. As the movement to informational capitalism has gained velocity, however, the idea of money has grown increasingly notional and has become increasingly detached from the real-world activities that it was designed to enable. A set of interrelated sociotechnical, institutional, and business changes—the advent of networked digital information and communication technologies, exponential growth in computing and processing power, the breakdown of regulatory barriers that separated “banking” and “investing” and slowed the flow of capital across state borders, and the development of new platforms for specialized intermediation of financial activities—has fundamentally restructured both the way that money behaves and the prevailing understanding of what finance is for. Within the political economy of informational capitalism, the financial sector has become an independent site of surplus extraction. As that sector has grown in size and economic power, many other, ostensibly more tangible activities have come to be understood as sites of financialization—as inputs to the extractive activities of finance capital.⁴⁴

One story that is commonly told about financial markets links the rise of financialization to the advent of networked digital information and communications technologies. By itself, that story is too simple. Both the turn toward informationalized abstraction and the drive to trade on information about the future have older, deeper roots. In the United States, trading in commodity futures originated in the nineteenth century with practices of “forward trading” intended to help finance shipments of grain,

lumber, and the like. The first known precursor of the modern mutual fund was a scheme for risk diversification created by a Dutch merchant in 1774, and currency trading has been an essential function of merchant banks for hundreds of years.⁴⁵ The early twentieth century witnessed the creation of new market institutions for both speculative trading and risk diversification across the financial sector. New commodity exchanges opened, margin trading migrated from commodity markets to securities and currency markets, and investment companies emerged and ballooned as a proportion of overall investment.⁴⁶

A constellation of late twentieth-century developments, however, both engendered quantum leaps in financial complexity and undermined the premises on which regulatory oversight had rested. One factor was rapid acceleration in technological capability. New digital information and communications networks enabled trades to be made and recorded instantaneously in both national and global markets. Aided by rapid increases in processing power, investment bankers began using complex computational models to devise more complex trades and automated trading algorithms capable of responding instantaneously to market fluctuations. As interest in complex trading intensified, market participants began to define new, ever more exotic instruments for “securitizing” a wide variety of activities. Trading in such instruments, including derivatives, credit default swaps, and the like, now dwarfs trading in more conventional securities markets. A vast and largely unregulated shadow banking sector undergirds these activities.⁴⁷

Another factor was rising demand for new vehicles for capital formation—and for new permutations of existing vehicles designed to avoid the accountability obligations that corporate law and securities law imposed. Aided by a growing theoretical and ideological orientation toward understanding the legal rules governing economic activities as defaults, corporate lawyers and their clients experimented with dual-class ownership structures designed to give privileged groups of shareholders greater voting power and control. An emerging class of venture capitalists developed information-gathering networks designed to identify promising start-up enterprises and contractual devices that enabled them to bankroll such enterprises in exchange for either large payouts at the time of their initial public offerings or continuing control using dual-class ownership arrangements. Hedge funds controlled by secretive, wealthy investors—including venture capitalists and other private equity investors—created new secondary markets in early-stage capital formation and other private extractive activities.⁴⁸

Meanwhile, new forms of intermediation were disrupting and restructuring financial markets. In the heady early days of the commercial internet, pundits prophesied that informed amateurs would break the financial services industry’s stranglehold on brokerage and investment advising. They were both right and wrong. Disintermediated “day trading” is yesterday’s news; today’s internet-based platforms for online trading are more likely to be subsidiaries of large financial conglomerates, which can more readily exploit the potential returns to scale that come with access to new streams of information about financial markets and participants. Such entities have pursued a variety of information-based strategies for positioning themselves as the new intermediaries of choice. At the same time, 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, affording new opportunities to existing, well-resourced players.⁴⁹ As a practical matter, financial markets today are comprised of a heterogeneous assortment of trading platforms serving varying constituencies, interconnected by flows of data about trades and investments but with different relationships to those flows.

Albeit with less fanfare, consumer banking has undergone a parallel and equally dramatic transformation. As banks pursued the vast profits that new financial instruments and deregulation offered, they began to reconceptualize the more humdrum activities associated with consumer banking as strategies for extracting surplus via account fees. As consumer-facing banks learned to deal in volume rather than in relationships, consumer finance offerings were redesigned to trigger charges that effectively escalated as consumers' resources declined: overdraft fees, fees for failing to meet minimum balance requirements, ATM transaction fees that landed most heavily on those who made repeated, small-volume withdrawals, and so on. Those changes, implemented over the second half of the twentieth century and continuing into the present, helped set in motion a process that Lisa Servon has christened the "unbanking of America." Increasingly large numbers of ordinary people—the poor, the young, the very old, and the barely making it—cannot afford to maintain bank accounts, while others rely on revolving credit to make ends meet. The unbanked, for their part, rely on check cashing services, payday lenders, and other "fringe finance" businesses that charge high fees for access to ready cash.⁵⁰

The next horizon in consumer finance, and the next competitive battleground for old and new financial intermediaries, is demonetization. Over the past two decades, volumes of credit and debit card transactions have grown steadily, in part because increasing amounts of commerce are conducted online but in part because banks and payment providers have made concerted efforts to extend fee-generating credit and debit card networks throughout sites of commerce in real space. Major information platform businesses such as Apple and Facebook have rolled out competing payment systems of their own, and alternative payment processors and fringe finance providers also compete vigorously for cashless payment business. Because many cashless payment systems operate outside the traditional banking system and its associated overlay of insurance and fraud-protection rules, however, they expose consumers who now take those protections for granted to a variety of hidden risks.⁵¹ Meanwhile, in the developing world, partnerships among governments, private foundations, and for-profit companies have framed new cashless payment platforms as tools for financial inclusion. Cashless payment systems, however, also undermine the flexibility, anonymity, and capacity for informality that are hallmarks of cash economies, and abrupt demonetization in such economies can disrupt markets and essential public services.⁵²

Perhaps the ultimate examples of financial dematerialization and datafication are new blockchain-based technologies for authenticating digital transactions. Like peer-to-peer trading platforms, blockchain technologies have been widely hailed for their disintermediating, democratizing potential—with the difference that the impact some have envisaged for blockchain technologies is even more radical. According to some digital-economy pundits (and a number of self-styled crypto-anarchists), blockchain technologies promise the end of state monopolies over currency, with a wide and

disorienting set of implications for everything from income tax reporting systems to state-centered governance.⁵³ Yet the development of blockchain is beginning to follow a less apocalyptic and more predictable path: attracted to blockchain for its built-in security, finance capitalists are underwriting major new efforts to develop and leverage blockchain-based trading platforms. Understood simply as a new and more efficient way to authenticate transactions and move money across borders, blockchain also seems more likely to reinforce the dominance of finance capital than to disrupt it.⁵⁴

Well-known narratives link the ongoing processes of dis- and reintermediation in finance to the disintermediation and dissolution of traditional regulatory institutions. Under the influence of ascendant neoliberal ideologies about the centrality of market processes and market-based innovation, policymakers and financial regulators came to see the financial sector as an important source of innovation in its own right. They gradually dismantled regulatory barriers to bank speculation and to the movement of capital across borders, and began to understand their own function as primarily that of facilitating capital formation and industry self-governance. Many commentators have chronicled both the rapid upsurge in financialization that followed the major deregulatory movements of the 1980s and 1990s and the subsequent, spectacular failures of secondary, ostensibly self-regulatory measures intended to guard against systemic risk.⁵⁵

This chapter, however, is not a lament for the demise of either the particular forms of financial activity that dominated in the heyday of the industrial economy or the characteristic forms of early-to-mid-twentieth century financial regulation. Rather, I want to underscore two very different points:

The first important point simply is that, as both banking and investment have changed beyond recognition, the various structural and institutional barriers that comprised the industrial era's Polanyian countermovement—the safety nets insulating ordinary people against ruinous consequences—disappeared, to be replaced with an apparent consensus that no such barriers were desirable or even feasible. Legislative and policy reforms instituted following the global financial crisis of 2008 were piecemeal and have remained continually under threat. As we will see in Part II, the existing regulatory toolkit also is poorly adapted to information-era realities. Meanwhile, internet-based disruption and disintermediation have proved double-edged swords. The emergence of the internet and the rise of alternative trading platforms and technologies, all heralded as inevitably democratizing developments, have both disrupted the visible structure of the finance industry and consolidated the increasing dominance of finance capital as an extractive enterprise.

The second important point is that narratives about regulatory absence are too simple to describe the roles that law and legal institutions have played and continue to play in the construction of the new realities. Participants in processes of datafication and dis- and reintermediation have mobilized legal resources, most notably contracts law, corporate law, and securities law, to help create and appropriate new derivative instruments, new capital ownership structures, and new intermediation arrangements. As new derivative strategies have become regularized, they have taken on reified form as financial instruments with distinct names and parameters and have engendered distinct sets of trading conventions. Venture capital arrangements and the changes in corporate

governance that they have engendered have undergone parallel processes of normalization. New intermediation ventures rely on contracts and also implicate other, highly entrepreneurial appropriation strategies. In particular, an important theme running through the new language of financialization, and a common denominator driving all of the intermediation strategies discussed previously, is privileged access to flows of data about trades and transactions. As we will see in the remainder of this section, privileged access to data is a common denominator in the ongoing reconstructions of labor and land as well.

Labor without Employment

Over the last half century, the movement to informational capitalism also has produced similarly dramatic changes in the conditions of labor. A series of interrelated and mutually reinforcing shifts, including the informationalization of production, the emergence of networked digital information and communications technologies useful for coordinating production across space and time, and the growing financialization of industrial activity, has comprehensively reconfigured patterns of work in the manufacturing and service economies. More recently, new platform-based ventures for intermediating various kinds of information and service work have thrown arrangements in a number of industries into disarray. In parallel with these changes, creative economies too are being reconfigured around new types of extractive practices that emphasize temporary employment and freelance production.

Like the informationalization of finance, the reconfiguration of labor markets has roots in the late nineteenth and early twentieth centuries. The Second Industrial Revolution ushered in not only the rapid mechanization and electrification of production and distribution, but also new theories about efficient ways of adapting labor practices to the mechanized rhythms of the factory floor, including most famously the time-and-motion-based approach to standardization developed by Frederick Winslow Taylor. Taylorist production methods transferred control over workflow from laborers to managers, speeding production and also facilitating efforts to extract the surplus value of labor. Notably, the Taylorist reconfiguration of the factory floor necessitated a parallel reconfiguration and informationalization of management, according to which “every activity in production [must] have its several parallel activities in the management center: each must be devised, precalculated, tested, laid out, assigned and ordered, checked and inspected, and recorded throughout its duration and upon completion.”⁵⁶ In due course, managerial theories produced comparable reorganizations of other types of work, including management itself. Over the course of the mid-twentieth century, new management subdivisions—marketing, finance, human resources, and so on—emerged and became defined through sets of formalized administrative practices.⁵⁷ Developments in information processing and communication that enabled more precise control of production, distribution, and administration lent the iteration and refinement of managerial theories and approaches additional momentum.⁵⁸

Over the last several decades of the twentieth century, the growing pace of informationalization has profoundly altered the relationship between capital and labor. Digital communications networks have enabled just-in-time extraction of raw materials; automated, on-demand manufacturing of goods; and delivery of goods and services at the

times and in the quantities needed. The combined impact of changing production practices and increasing financialization has engendered new types of worker hiring and retention practices. Workforce needs are more variable but also amenable to data-driven forecasting, and the communication challenges that formerly would have prevented on-demand labor scheduling have been all but eliminated. In many industries, the expenses of maintaining a permanent workforce are perceived as undercutting the level of return that investors and secured creditors require. The result has been a rise in scheduling practices that are flexible from the employer's perspective and unpredictable from the worker's, changing season by season and sometimes day by day. 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.⁵⁹

The newest developments in efficient workforce management purport to eliminate centralized management altogether. New platform-based services in the so-called "gig economy" match workers directly with jobs: TaskRabbit and Mechanical Turk for temporary office work, Uber and Lyft for transportation, Airbnb for lodging, and so on. 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.⁶⁰

The newfound precarity of wage labor in the informationalized economy is, in reality, quite old, and like the labor practices in newly-constituted industrial-era factories, it has a way of placing extreme and often unsustainable burdens on "the human individual who happens to be the bearer of this peculiar commodity."⁶¹ Arrangements in the era of precarity externalize the costs of work—the Starbucks barista's mobile phone bills, the Uber driver's fuel and auto insurance payments, and so on—and internalize the benefits. Lacking the ability to forecast income or the timing of work obligations from week to week or month to month with any confidence, precarious workers often must struggle to pay basic expenses and fulfill child- and elder-care responsibilities. More ambitious goals—pursuing higher education or technical training, saving for retirement, and so on—are beyond their reach, and life's ordinary minor disruptions—a blown tire or an emergency room visit—can have catastrophic effects.⁶²

Narratives about the disintermediation of work and the virtualization of production also work to erase (and, sometimes, to de-race) the physical labor that the informational economy requires. The energy and labor inputs to online shopping are nearly invisible to consumers. Packages from Amazon.com and other online retailers appear as if by magic, and used packing materials are speedily carted away to equally invisible landfills. The Amazon warehouse worker's outlays for back braces and physical therapy represent yet another kind of externalized cost that rarely figures in policy discussions about the benefits of e-commerce. To scan the books that form the corpus of its Google Book Search service, Google hired temporary, low-wage workers; restricted them to a separate building on Google's lush Mountain View campus; and forbade them to interact with members of its permanent workforce. Soon after, the corpus simply

appeared online, representing yet another example of the seemingly magical ability of networked digital technologies' ability to transcend space, time, and matter. The repetitive manual labor of the precarious workforce that called it into being can be glimpsed only as an occasional, latex-gloved, (brown or black) finger fragment hovering at the edge of a page.⁶³ (Physical labor is not the only resource rendered invisible. According to a 2013 report, the global network of information and communication technologies and associated personal devices accounts for about 10 percent of the world's total energy consumption, and that number has surely grown.⁶⁴)

Some of the most celebratory justifications for the freelance economy emphasize the freedom that a "world without work" creates to engage in creative pursuits and nonmarket production, while other, more skeptical narratives emphasize the reorganization of economic activity for the benefit of the Silicon Valley technorati.⁶⁵ To focus only on the dematerialization of industrial and service work, however, would be to miss important parallel developments affecting the structure of work in the creative industries. As the movement to informational capitalism gains in velocity, creative work is also in the process of being reconfigured for optimal human capital extraction.

As we saw earlier in this chapter, the complex doctrines that have evolved to mediate relationships between corporate intellectual production intermediaries and creative employees systematically favor the former with respect to intellectual property ownership. Similar asymmetries appear in other aspects of the employment relationship. As Orly Lobel has shown, production intermediaries in the creative and technical industries increasingly deploy a range of contract-based techniques, including restrictive lock-in agreements, noncompete provisions, and clauses extending control of innovative output into both pre- and post-employment periods.⁶⁶ Like other firms, moreover, information-economy firms often opt to proceed without conventional employment relationships; consequently, freelance creative and technical workers can (and do) experience precarity, too. Contracting practices in the copyright industries also shape the substance of creative production, locking creative workers into arrangements that attempt to freeze their future outputs into predictably lucrative patterns.⁶⁷ All of these techniques have as their goal and effect a pervasive enclosure of the inputs to creative production. Put differently, they are ways of dematerializing, standardizing, and appropriating the creative capital that makes the informational economy work.

Here again, there is nothing sacred about the categories of "employer" and "employee," categories that themselves originated as ad hoc adaptations intended as fulcrum points from which to mitigate the excesses of the industrial economy. As before, my purpose here is to underscore the same two basic points:

The first point relates to the dismantling of those components of the Polanyian countermovement that related to the protection of labor. People have needs for stability and support that the system of wage labor for employers and its associated regulatory overlay addressed—never fully or perfectly, but at least deliberately and systematically. The freelancer-driven economy is indeed lighter, nimbler, and more efficient; those descriptions, however, apply most aptly to the processes of surplus extraction that it is designed to enable, which derive their power in part from their ability to avoid burdensome protective obligations that had coalesced around the old categories. Newer

protective arrangements tailored to the growing freelance economy have yet to be put in place. More basically—and something that protracted litigation over who is “really” an employer does not address—the categories that would support such arrangements have yet to be determined.⁶⁸ Additionally, the new precarity is globalized in ways that the earlier era’s labor-related dislocations were not. The extension of gig-economy ventures into developing countries has begun to exert extreme downward pressure on the earnings of user-workers located in developed countries. Efforts to achieve universal internet access rely in complex and unacknowledged ways on the labor required to extract the rare earth metals that today’s smart devices require, manufacture the microprocessors that cause them to function, and assemble those devices in factories half a world away.⁶⁹

The second point, once again, concerns the productive role of law. In the search for a regulator of first resort, it is important not to pass too quickly over the entrepreneurial legal arrangements that underlie the data-driven reconfiguration of labor. Both temporary-employment arrangements and the details of user-workers’ relationships with platform companies must be specified. Over time, ad hoc contracting practices requiring workers to disclaim the indicia of employment relationships have coalesced into regularized, standard-form agreements.⁷⁰ Writing about gig-economy instruments that take the form of licenses to use the matching services of entities such as Uber and TaskRabbit, Martin Kenney and John Zysman analogize the resulting model to the “putting out” of prefabricated pieces for assembly that occurred early in the industrial era.⁷¹ 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 work similarly, configuring labor as a modular input to the profit models of employers and intermediaries (and, as we will see in Chapter 5, keeping disputes about the terms and conditions of work out of court and out of the limelight). As in the case of finance, the same arrangements also iterate and reiterate appropriation strategies. Gig-economy businesses such as Uber and TaskRabbit are disintermediators but also reintermediators, converting the labor of user-workers (and user-customers) into flows of monetizable data to which they enjoy privileged access.

Land without Presence

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 datafication of industrial-era resources. In the U.S. in the decades following World War II, policymakers seeking to foster more widespread distribution of homeownership crafted a series of federal initiatives designed to expand access to mortgage financing. One strategy involved the resale of mortgage obligations and was conceived as a device for connecting individual borrowers with the deeper pockets and more diverse risk portfolios of participants in nationwide capital markets.⁷² Ultimately, however, that strategy did much more than simply increase access; it fundamentally transformed the way that ownership of real property is understood and valued. It thereby opened the way for a set of processes with ultimate effects that were the opposite of democratic and that proved powerful enough to destabilize the global economy.

As in the cases of money and labor, one vector of change was technological: The information technology explosion of the 1980s and 1990s enabled a fundamental shift in practices of bundling and reselling local mortgage loans. Initially, mortgage obligations with the same general profiles were simply bundled and resold. Consistent with the pattern of informationalized “innovation” in financial markets generally, new digital information and communication technologies enabled the creation of new and increasingly complex derivative instruments based on the payment streams from mortgage lending. Rather than simply bundling loans together, investment bankers used flows of data and algorithmic modeling to construct elaborate arrangements for converting portfolios of loans into synthetic investment “tranches”—for which, in the best Ponzi-scheme tradition, they projected high revenues and low risks.⁷³

As is now well known, during the 1990s and 2000s, secondary market demand came to dominate the mortgage lending landscape. As new investment vehicles based on securitized mortgage loans become more and more specialized and complex, they were touted and eagerly received as surefire recipes for reaping large profits. To satisfy the secondary market demand, the nominal owners of the underlying real properties were encouraged to assume more and more debt—debt that was purely notional or imaginary to the investors but that threatened real, concrete consequences for its subjects if the bottom fell out, as it eventually did. Unsavory lending practices and deeply-rooted cultural romanticism about the promise of home ownership also played roles in leading many first-time home buyers to assume debts that they could not possibly repay. At the same time, conventions for structuring mortgage-backed securities that supposedly guaranteed broad and rock-solid risk distribution instead guaranteed the absence of oversight.⁷⁴

So far, the role of law in this story is unremarkable. Self-evidently, mortgage lending requires the preparation and execution of legal instruments. One might assume, then that the ordinary rules of contract and real property law simply provided the neutral background against which individual mortgage loan instruments were drafted, signed, and enforced.

That story, though, overlooks the extent to which mortgage securitization both relied upon fundamental conceptual and institutional shifts in the legal landscape and precipitated others. To begin with, practices of mortgage resale and securitization that today are regarded as routine would not have been possible without prior acceptance of the idea of owning debt obligations as assets. The idea of negotiability has roots in the earlier practice of assigning debts to third parties for collection, but with an important difference: the purchaser of a negotiable instrument can lay claim to the payment stream without regard to the nature of the underlying agreement that generated the debt. The point of negotiability is to detach the obligation to pay from the circumstances that define (and may limit) it. Beginning in the late nineteenth century, this act of conceptual jujitsu elicited and then naturalized new legal tools, most notably the provisions of the Uniform Negotiable Instruments Law of 1897, which preceded the negotiable instruments provisions of the Uniform Commercial Code and stands as an important conceptual precursor for the securitization of mortgage debt. Notably, although the justifications advanced for drafting uniform negotiability rules emphasized a need to facilitate

business-to-business transactions, the new rules were used principally to facilitate trade in consumer obligations.⁷⁵

The next step in the legal project of detaching interests in real property from the material world was both less considered and more venal. As the fever for mortgage securitization took hold, desire for regulatory avoidance took aim at real property law's recordation formalities. Under state real property recordation laws, when a mortgage loan changes hands, timely recordation of the transfer is important to preserve the chain of title and protect the mortgage holder in case of default. Mortgages subjected to securitization changed hands rapidly—often multiple times in the course of a single deal—and the underwriters who concocted the securities came to view the transaction costs imposed by local real property recording offices as a drag on financial innovation. Some of the largest players turned to their lawyers to craft an institutional workaround. The result was the Mortgage Electronic Recordation System (MERS), an organized, bank-funded scheme for disintermediation of local property recordation requirements and fees. Under the MERS system, when a member bank purchased a mortgage loan (or a large number of them), it would enter MERS in the local property register as the “nominee of record” and pay the required fee just once. It would then separate the promissory note (the document creating the borrower's legal obligation to repay the loan) from the mortgage instrument (the document creating an interest in real property as security for the loan) and convey the latter to MERS to hold while the note was traded amongst the member banks. No rerecordation need be made (or so the argument went) as long as the loan remained within the MERS system.⁷⁶

In fact, the MERS system and its participants did not maintain good internal records of member bank trades. The continuing fallout from that decision plays out now-familiar themes about the burdens of economic dislocation, the horizons of possibility for protective countermovements, and the productive nature of the relationship between law and economic power. MERS' failures of recordkeeping have made it nearly impossible to reconstruct chains of title for many securitized loans and the underlying real properties. Across the country, a crucial component of record title has simply vanished into the ether. The inability of foreclosure claimants to trace title undeniably worsened the foreclosure crisis that contributed to the 2008 market crash.⁷⁷ It also theoretically compromises all future transfers of many properties, a state of affairs that has slowed recovery in some local markets and that likely will require new processes of legal innovation to overcome.

Here the story of land's dematerialization differs to some extent from those of money and labor: Perhaps because home ownership is woven into the fabric of the “American dream” in ways that sound labor policy is not—or perhaps because the consequences of the foreclosure crisis came to rest on the middle class, and so received media coverage that made them more visible and visceral than the constant, grinding woes of the working poor—both federal and state governments moved quickly to craft protective measures designed to blunt financialization's bite. The results of those efforts, however, speak volumes about the ability of the political process to mount an effective response. Measures that would have aided homeowners already facing foreclosure or unable to sell their homes were implemented only partially and half heartedly.⁷⁸ The most visible reforms were prospective, raising standards for future mortgage lending—and thereby improving inputs to future financialization.⁷⁹

Where lawyers are concerned, some accounts of the foreclosure crisis have assigned responsibility principally to bad actors rather than to the underlying institutions. On some retellings, the lending and contracting practices that led to gaps in the chain of title, and that in turn gave rise to the phenomenon of robo-signing legal documents in foreclosure proceedings, were failures of professional discipline at the bottom of the legal profession's food chain.⁸⁰ But sloppiness and venality at the bottom of the food chain took their cues from sloppiness and venality at the top, on the part of those who created MERS while either ignoring or deliberately disregarding the systemic destabilization it threatened. Those who concocted MERS, moreover, seemed either to have overlooked other weedy but essential details of 50 separate state property systems—for example, the rules that determined whether mortgage and note could be held separately and whether MERS could claim dual status as both agent and “nominee”—or brushed the details aside in the supreme confidence that courts too would see them as obstacles to progress.

As before, there is nothing sacred about local recordation *per se*. Arguably, in a nationwide economy, operating thousands of small local sites for recordation of land ownership is inefficient; undeniably, systems comprised of paper record books and/or incompatible legacy databases are error-prone and difficult to search. There is also nothing sacred about the paper-based formalities that MERS ignored and that continue to underlie negotiable instruments law more generally. In the pages of law journals, a debate is now underway about whether the negotiability requirements that traditionally have applied to mortgage loan instruments should be reformed or scrapped entirely in favor of some more efficient information-age alternative.⁸¹ But MERS did not open its platform to the public, and it did not collect the information necessary to preserve chain of title in any form. Rather, it was optimized for redistributing as much as possible of the economic surplus flowing from mortgage lending to secondary investors. When all is said and done, self-interested, privatized institutional innovation in the form of the MERS system catalyzed both a massive redistribution of land-based wealth to financial institutions and their well-heeled clients and a massive privatization of resources that formerly had flowed to the public sector to pay for maintenance of roads and other common infrastructure. In operation, it reconstituted the system of record title as *tabula rasa* for the new appropriation strategies.

From Markets to Platforms

The processes of datafication and reintermediation described in the previous section point to 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. As we have just seen, the emergence of platform-based business models has reshaped patterns of financial activity, workforce management, and land ownership. Platforms have also reshaped information transmission, entertainment, social interaction, and consumption of

goods and services, and have destabilized the locally embedded systems that previously mediated those activities in many different types of communities.

Vibrant and fast-growing literatures explore the power that platforms exert over economic life, social interaction, and public discourse. I will return to each of those topics in later chapters, but my goal in this section is the more modest one of teasing out the connections between platform logics and the emergent design of informational property institutions. 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 of data and attention have emerged as key motifs in information-economy narratives about resource ownership and access. Along the way, the particular data flows of greatest interest to competing platforms—data extracted from people as they invest, work, operate businesses, socialize, and engage in innumerable other activities—have emerged as a vitally important fourth dematerialized factor of production.

Prologue: Access and Legibility

No form of economic or social organization is ever wholly new. Preexisting modes of organization impose their own logics, and path-dependencies matter. It is important to begin by recognizing two important ways in which platforms represent continuity as well as change. The intertwined functions that platforms provide—intermediation that provides would-be counterparties with *access* to one another and techniques for rendering users *legible* to those seeking to market goods and services to them—have evolved to become the core organizational logic of contemporary informational capitalism. Those functions, however, have important antecedents in twentieth-century direct marketing and advertising practices.

To appreciate both the continuity and the change that platforms represent, it is instructive to consider two early precursors: the Sears, Roebuck catalog and the Nielsen ratings system. Over two decades at the turn of the twentieth century, entrepreneurs Richard Sears and Alvah Curtis Roebuck parlayed a mail-order watch and jewelry business into a wildly successful mail-order empire selling everything from jewelry to farm equipment. Inclusion of a product in the Sears, Roebuck catalog gave its manufacturer access to a marketing juggernaut with the ability to reach consumers nationwide, the range to offer concert grand pianos and engraved shotguns, and the power to undercut the prices charged by local “five-and-ten-cent stores” for everyday essentials.⁸² Three decades later, Arthur Nielsen, a pioneer in the field of statistical market research, began to develop a system designed to give subscribing advertisers and their clients a different kind of access to consumers, based on aggregate measurements rather than solely on one-way communication. The system originated as a simple “audimeter” that recorded when household radios were on and the stations to which they were tuned; over time, the company expanded to television and developed techniques for correlating the recorded information with demographic information and individual viewing information collected from participating households via paper “diaries.”⁸³ In this manner, it gradually began to develop more granular profiles of the viewing population.

Both the Sears, Roebuck catalog and the Nielsen ratings system provided access to vast pools of consumers, but they ways they provided access and the relationships they

envisioned between and among manufacturers, intermediaries, and consumers were different. To use Dan Bouk's periodization, the catalog represents the era of the ideal customer as social imaginary. Sears, Roebuck & Co. lacked and likely could not imagine collecting precise, granular information about customer desires and resources, so it sold products it envisioned customers as wanting.⁸⁴ To the extent that measurements factored into those determinations, they did so as proxies for the ideal customer rather than as empirical representations of any particular customer. The Nielsen system represents the era of the mass audience, constructed on the basis of numerical aggregates that purported to represent the audience itself.⁸⁵ The era of the mass audience also represents a critical inflection point, in which the legibility rubric supplied by an intermediary became both an object of regularized economic exchange and an increasingly powerful, institutionalized arbiter of the knowledge upon which market participants relied. The Nielsen ratings did not simply describe the mass audience but also encoded both a way of understanding it and strategies for managing it.⁸⁶

Information platforms echo some aspects of these early precursors, but also rework the basic themes of access and legibility in ways that neither Richard Sears nor Arthur Nielsen could have envisioned. Selection of one's product for inclusion in the Sears, Roebuck catalog might have offered a ticket to marketplace success, but it wasn't essential for economic survival in an era in which much commerce remained local. Many manufacturers refused the opportunity because of the production quantities demanded or because they feared that local retailers who opposed the spread of mail-order businesses would boycott their wares.⁸⁷ Access to basic media infrastructures—the postal system and print advertising distributed via newspapers and magazines—was becoming more nearly essential for survival, but the relevant infrastructures were available to (almost) anyone willing and able to pay the required fees. As media infrastructures—now digital and networked—have evolved into platforms, both the conditions of access and the need for access have changed. Access to the facilities offered by Amazon or Google or Visa/Mastercard or the iOS operating system requires assent to complex sets of legal and technical protocols. And access to platforms—whether online marketplaces or search engines or payment systems or computing environments—is increasingly essential to reaching any customers at all.

The story of legibility is more complicated still. In the late 1980's, proprietary infrastructures for radio and television broadcast began to give way to a far more complex ecosystem that included proprietary infrastructures for cable television and internet access and open protocols for internet publishing. The proliferation of cable channels and home video recording technologies initially caused an existential crisis for advertisers, whose aggregate measures of the mass audience and its tastes began to dissolve into seemingly unmanageable fragments.⁸⁸ That fragmentation, however, also lent momentum to practices of targeted marketing that had originated in the early twentieth century, and that were premised on the importance of reaching specialized pools of desirable consumers.⁸⁹ At the same time, new technologies for networked digital communication were emerging. Efforts to adapt those technologies for commercial exploitation ultimately produced new, highly granular ways of measuring audiences and predicting audience appeal. As mass media technologies evolved in ways that facilitated specialization and differentiation, the mass consumer gave way to the individual

consumer, and the aggregate measure to the data double (a construct that we will consider more carefully in Chapter 2).⁹⁰

At the same time, and reflecting the increasing normative force of legibility as an overarching frame for commercial endeavor, the legibility function began to burrow into the core of the infrastructure itself. The emergence of the commercial internet, with its enormous number and variety of information sources, accelerated the centripetal movement. A world with a vast diversity of information sources required intermediation for those sources to be meaningfully accessible, and legibility became the essential function for an intermediary to provide to advertisers seeking access to users.

A Platform Is Not (Just) a Network

Reorganization around intermediation and legibility has engendered profound structural changes in the architecture of contemporary networked communication. In discussions of the information economy, the terms “network,” “infrastructure,” and “platform” are often used interchangeably, but platforms are not the same as networks, nor are they simply infrastructures. Platforms represent infrastructure-based strategies for introducing friction into networks. Those strategies both rely on and reinforce the centrality of a particular way of (re)configuring networked digital communications infrastructures for data-based surplus extraction.

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.⁹¹ 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 (network externalities) as those networks grow in size and scale, and the relatively low costs of digital interconnection have enabled digital networks to become very large.⁹²

Infrastructures are shared resources that facilitate downstream production of other goods. Roads and electric power grids, for example, play essential roles as inputs into a variety of downstream goods, as do less tangible resources such as 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.⁹³

Digital information and communications technologies function both as infrastructures and as networks. As scholars in fields ranging from industrial organization to geography to media and communications studies have shown, the forms of connectivity they provide have reshaped seemingly every area of human activity.⁹⁴ In

theory, the networked information infrastructure still known as the internet is “open,” and for some purposes, that characterization is accurate. For most practical purposes, however, the “network of networks” is becoming a network of platforms; for most users, internet access and use are intermediated from beginning to end.

As we will see in more detail in Chapter 2, the platform business model emerged at a point of fortuitous technological and economic convergence. New techniques for customer tracking, immersive social design and data analysis all promised new possibilities for profiting from targeted marketing in an increasingly fragmented media system. At the same time, legibility became a service most effectively and profitably provided at the infrastructural level. Venture capital investors whose support offered a path to wider capital markets demanded a revenue model, and the demands of that model in turn began to drive platform design. One important result of those shifts was a pervasive financialization of platform firm structure along the lines described earlier in this chapter. In particular, dual-class ownership arrangements that vest continuing control in founding “innovators” and early-stage venture capital investors have become ordinary and expected.⁹⁵ Another result was the emergence of a fourth dematerialized and informationalized factor of production: the data flows extracted from people. Today, such flows underwrite a wide and growing variety of profit-making activities. Additionally, the commercial and extractive logics that drove emergence of the platform business model now impose more sweeping design imperatives for datafication and intermediation of the networked information environment. As a result, networked media infrastructures have become pervasively platformized.

Platforms exploit the affordances of digital information and communications networks and supply infrastructures that facilitate particular types of interactions, but they also represent strategies for bounding networks and privatizing and disciplining infrastructures. They 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 that might facilitate defection to rival platforms.

Platforms use technical protocols and centralized control to define networked spaces in which users can conduct a heterogeneous array of activities and to structure that space for ease of use. The vehicle for managing the tensions between heterogeneity and ease of use is modularity; platform protocols impose a modular structure that enables certain types of flexibility but at the same time forecloses others. Protocol-based control also enables intermediation and facilitates legibility, allowing the platform to serve its own priorities.⁹⁶ In Tarleton Gillespie’s formulation, the term “platform” appears to offer users a “raised, level surface” on which to present themselves, but at the same time it elides the necessary work of policing the platform’s edges.⁹⁷ The latter power is one that the fictionalized construct of the market lacked, and it comprehensively reshapes the conditions of economic exchange.

How Platforms Shape Economic Exchange

Economically speaking, platforms represent both horizontal and vertical strategies for extracting the surplus value of user data. Because that project 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. Commentators have begun to puzzle over the implications of the dominance and the staggering market capitalization of the largest platform firms.⁹⁸ The characteristic “rich-get-richer” pattern of network organization, however, militates in favor of the emergence of dominant platforms, and platform firms also have devised a variety of other strategies for attaining and maintaining dominance, each targeting multiple user groups.⁹⁹

To begin with, platforms both enable and benefit from competitive dynamics of economic exchange that differ in profoundly important ways from those of traditional, one-sided markets. A core tenet of microeconomic theory is that, ordinarily, markets have porous boundaries and therefore are open to entry and potentially to disruption by transformative offerings that reshape market boundaries altogether. Even dominant incumbents remain vulnerable unless some factor—either anticompetitive behavior or a natural or regulatory monopoly—enables those incumbents, or incumbent business models more generally, to become entrenched. The most reliable sign of such entrenchment is supracompetitive pricing, although antitrust lawyers and competition regulators also employ various secondary heuristics.

The platform economy rewrites all parts of that story, reshaping the conditions of entry, the scope for disruption, and the sources and manifestations of economic power. Platforms do not simply enter markets, they replace (and rematerialize) them. And platforms, unlike markets, have taken shape as discrete legal entities with their own aims and agendas.

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. 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.” Because the economics of platforms permit so many different arrangements, pricing ceases to be a reliable sign of market power, and courts and regulators lose a previously reliable metric for determining whether power has been abused.¹⁰⁰

Another set of strategies for leveraging economies of scale into more durable patterns of competitive advantage involves preferential placement, and exploits a conundrum that confronts platform users as platform economies of scale become more and more overpowering. Platform users—whether buyers and sellers or social network members seeking their counterparts—seek access to platforms in order to be found. They soon discover, though, that while access to platforms is a necessity, access alone is

insufficient; competitive or reputational success in a platform environment requires information-based strategies for being visible to other users. In theory, the platform's legibility function should provide effective matching in ways that take account of "long tail" patterns of supply and demand; in reality, the results of algorithmic matching often seem to prioritize the most popular results. Platforms have developed various techniques for offering and monetizing preferential placement, such as "sponsored search results" (e.g., Google's AdWords and AdSense programs) and "enhanced listing placement" (for example, Amazon's Featured Merchant program).¹⁰¹ Because of the platform environment's operational secrecy, however, purchasers of these services cannot easily monitor the quality of what they have purchased. More generally, platform users cannot easily determine whether platform firms are engaging in other, undisclosed varieties of preferential placement.¹⁰²

A third set of strategies for leveraging economies of scale into more durable patterns of competitive advantage involves interplatform affiliation. Smaller and more specialized platforms may contract with more dominant platforms to provide particular services—for example, payment processing, streaming video, games for social network users, and so on. Such arrangements benefit both dominant and niche platforms, giving niche platforms access to a larger pool of users and dominant platforms access to a larger and deeper pool of information about users' online activities. It is unsurprising, then, that the interrelationships among platforms have become increasingly dense and complex. Such agreements, though, also create risks for both parties. A dominant platform must consider the possibility that what had been envisioned as a niche or add-on service will become a new species of dominant intermediary in its own right, as internet browsers, search engines, social networks, and mobile operating systems all have done. Niche platforms, meanwhile, are no better placed than platform users to monitor the behavior of dominant platforms. They may find themselves receiving fewer or different benefits than expected or competing with the dominant platform's own offerings under conditions that seem to place them at a disadvantage.¹⁰³

From the perspective of users, advertisers, and niche platforms, dominant platforms function in a manner analogous to utilities, supplying basic information services now deemed essential to a wide variety of economic and social activities. The tools for effecting legibility constructed by giant information businesses such as Google, Apple, and Facebook have become global platform-based "superstructures," subsuming and rematerializing not only markets but also and more broadly information-gathering and social interaction.¹⁰⁴ At the same time, however, modeling and understanding the economic, social, and informational dynamics of the platform environment has become extraordinarily difficult. As we will see next, platforms also use legal strategies to maintain and deepen the informational asymmetries on which their competitive strategies rely.

Points of Access, Points of Control

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 a 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. In subsequent chapters, I will consider some of the implications of that bargain for patterns of information flow to and about platform users and for society more generally; here, I focus more narrowly on implications for the landscape of intellectual property law. One important byproduct of the access-for-data arrangement is a quiet revolution in the legal status of data and algorithms as (de facto if not de jure) proprietary information property.

A principal worry for any platform is disintermediation by a would-be competitor, and so platform providers work to define both collected data and algorithmic logics as zones of exclusivity. 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 extended to users—a boilerplate terms-of-use agreement not open to negotiation—asserts a nonnegotiable authority over the conditions of access that operates in the background of even the most generative information-economy service. The terms-of-use agreement represents an example par excellence of the turn to boilerplate that now characterizes so much routine commercial interaction. 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.¹⁰⁵

From an intellectual property perspective, the contractual arrangements employed by platform firms 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. Scholars of property law have begun to pay attention to the constructed “thingness” of certain types of interests that today are understood as property-like but that are contractual in origin.¹⁰⁶ Trade secrecy law, a shifting and uncertain hybrid between property and contract, traditionally has presented fertile ground for opportunistic propertization via contract, but negotiated trade secrecy agreements generally are ad hoc and context-dependent just as the underlying secrets are. Platform contracts work in tandem with platform protocols to leverage trade secrecy entitlements into de facto property arrangements that affect large numbers of people with no direct relationship with the platform owner. The terms themselves are, of course, “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 algorithmically intermediated environments that use technical protocols to define the parameters of permitted behavior.¹⁰⁷ The combination of scale, asserted contractual control, and technical control enacts enclosure of both data and algorithmic logics as an inexorable reality of twenty-first century networked commercial life.

The *logic of performative enclosure* that infuses the access-for-data bargain carries over into platform dealings with app developers, advertisers, and other commercial counterparties, where it is paired with subsidiary strategies of performative openness. Even as they jealously guard access to both data collected from users and the

algorithms used to process the data, platforms entice developers and advertisers with promises of access. So, for example, Facebook offers advertisers placement precisely targeted to the inferred needs and desires of its billions of users but never direct access to the data or algorithms themselves. Application developers receive access to carefully curated data sets, data structures, and programming interfaces. Google's vaunted commitments to open data and open code do not extend to its algorithms or to the data it collects about its users, and it imposes other restrictive conditions on developers seeking to offer Android devices or Android-compatible applications. Amazon releases programming interfaces to developers but simultaneously maintains tight, cryptographically enforced control over other operational aspects of its system.¹⁰⁸

For the most part, traditional intellectual property rights play helpful but only secondary roles in the process of de facto propertization, 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. Access to a branded exchange as an Amazon reseller, a Google AdSense partner, or an iPhone- or Facebook-authorized app enables 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 Alphabet (Google) shows, however, not all platforms consider copyrights a necessary tool for limiting access. At least from Google's perspective, exclusive control of data and algorithms is a more reliable guarantor of dominance than copyrights might be.¹⁰⁹

The roles of patents in the platform economy are more varied. Because the communal founding ethos of the internet retains strong normative force in technical communities, holders of information technology patents must contend with norms favoring licensing on a fair, reasonable, and nondiscriminatory basis. Pooling arrangements for standard-essential patents have thrived, but interests in patenting protocols and in holding out for preferential treatment in pooling also have persisted. What is standard-essential also is open to some debate. Although there has been broad agreement that basic internet protocols are too important to monopolize, patents and patent portfolio strategies play significant roles in many information technology markets.¹¹⁰ Platformization also has begun to shape biotechnology research and development, with a number of new start-up firms organized around diagnostic or therapeutic protocols with multiple downstream applications.¹¹¹

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. As we are about to see in the next chapter, platforms are not the only information-economy actors using performative strategies to appropriate new data flows. Platforms' organizational centrality within the information economy, however, lends their strategies powerful resonance.

Law and the Construction of Information Property: Conclusions and Questions

This chapter has advanced three primary arguments: First, the ongoing movement to informational capitalism is about much more than ownership of intellectual property and control of code. It also entails other important changes that involve both inputs to production and the organization of economic activity. Second, informational property rights are emergent institutional formations. Over time, patterns of dealing in intangibles can cause the contours of traditional doctrines to shift. Finally and importantly, none of the shifts now underway as part of the movement to informational capitalism is organic; rather, they are the results of the self-interested, strategic activities of many different players.

Yet the investigation in this chapter also has surfaced additional questions: where do the new raw materials that constitute the fourth factor of production in the emerging informational economy come from, and who decides on their allocation? Who or what determines the proper allocation of accountability for harms flowing from datafication and platformization? What accounts for the startling power of platforms to command adherence to their terms, and have any countervailing obligations emerged that platforms are bound to respect? As we will see in the remainder of Part I, answering those questions requires moving beyond investigations of rights and correlative duties to respect them. The remaining chapters in Part I examine other ongoing processes of decomposition and recomposition in the landscape of information-economy legal entitlements.

¹ Karl Polanyi, *The Great Transformation: The Political and Economic Origins of Our Time*. Boston: Beacon Press (1957).

² Catherine L. Fisk, "Removing the 'Fuel of Interest' from the 'Fire of Genius': Law and the Employee-Inventor, 1830-1930," *University of Chicago Law Review* 65 no. 4 (1998): 1127-1198; Catherine L. Fisk, "Working Knowledge: Trade Secrets, Restrictive Covenants in Employment, and the Rise of Corporate Intellectual Property, 1800-1920," *Hastings Law Journal* 52 no. 2 (2001): 441-535; Joshua L. Simmons, "Inventions Made for Hire," *New York University Journal of Intellectual Property and Entertainment Law* 2 no. 1 (2012): 1-50.

³ Catherine L. Fisk, "Authors at Work: The Origins of the Work-for-Hire Doctrine," *Yale Journal of Law and the Humanities*, 15 no. 1 (2003): 1-70; Simmons, "Inventions Made for Hire."

⁴ Robert P. Merges, "One Hundred Years of Solicitude" Intellectual Property Law, 1900-2000," *California Law Review* 88 no. 6 (2000): 2187-2240; P.J. Federico, "Commentary on the New Patent Act." *Journal of the Patent and Trademark Office Society* 75 no. 3 (1993): 161-231. By contrast, legislated expansions of patent rights in the nineteenth century primarily addressed narrower issues related to the scope and duration of individual patents. See Adam Mossoff, "Who Cares What Thomas Jefferson Thought About Patents? Reevaluating the Patent 'Privilege' in Historical Context," *Cornell Law Review* 92 no. 5 (2007): 953-1012.

⁵ Jessica Litman, *Digital Copyright* (Amherst, NY: Prometheus Press, 2001); Jessica Litman, "Copyright, Compromise, and Legislative History," *Oregon Law Review* 68 no. 2 (1987): 275-362.

⁶ James Boyle, *Shamans, Software, and Spleens: Law and the Construction of the Information Society* (Cambridge, MA: Harvard University Press, 1998); Oren Bracha, "The Ideology of Authorship Revisited," *Yale Law Journal* 118 no. 1 (2009): 186-271.

⁷ On the nineteenth-century American understanding of the purposes of patent and copyright protection, see B. Zorina Khan, *The Democratization of Invention: Patents and Copyrights in American Economic Development, 1790-1920* (New York: Cambridge University Press, 2005). For an exploration of the factors shaping patent law's understanding of social obligation during the Progressive Era, see Kali Murray, "Constitutional Patent Law: Principles and Institutions," *Nebraska Law Review* 93 no. 4 (2015): 901-949;

on copyright and social obligation, see *Twentieth Century Music Corp. v. Aiken*, 422 U.S. 151, 156 (1975) (“The limited scope of the copyright holder’s statutory monopoly, like the limited copyright duration required by the Constitution, reflects a balance of competing claims upon the public interest: Creative work is to be encouraged and rewarded, but private motivation must ultimately serve the cause of promoting broad public availability of literature, music and the other arts.”). Early examples of the Chicago-style, incentives-based approach to intellectual property include Edmund Kitch, “The Nature and Function of the Patent System,” *Journal of Law and Economics* 20 no. 2 (1977): 265-290; William M. Landes & Richard A. Posner, “An Economic Analysis of Copyright Law,” *Journal of Legal Studies* 18 no. 2 (1989): 325-364. An influential contemporary articulation is William M. Landes & Richard A. Posner, *The Economic Structure of Intellectual Property Law* (Cambridge, Mass.: Harvard University Press, 2003). Today, even the harshest critics of broad intellectual property protection tend to be thoroughly steeped in the belief that the economic perspective is what matters most. See, for example, Mark A. Lemley, “Faith-Based Intellectual Property,” *UCLA Law Review* 62 no. 5 (2015): 1328-1347; Kal Raustiala & Christopher Sprigman, *The Knockoff Economy: How Imitation Sparks Innovation* (New York: Oxford University Press, 2012).

⁸ Compare “The Copyright Term Extension Act of 1995,” Hearing Before the Senate Committee on the Judiciary, 104th Cong. 55-58 (1995) (statements of Bob Dylan, Don Henley, Carlos Santana, and Stephen Sondheim), and “Pre-1978 Distribution of Recordings Containing Musical Compositions; Copyright Term Extension; and Copyright Per Program Licenses,” Hearing Before the Subcommittee on Courts and Intellectual Property of the House Committee on the Judiciary, 105th Cong. 27-29 (1997) (statement of Julius Epstein, screenwriter of “Casablanca”), with “The Role of Voluntary Agreements in the U.S. Intellectual Property System,” Hearing Before the Subcommittee on Courts, Intellectual Property, and the Internet of the House Committee on the Judiciary, 113th Cong. 12-25 (2013) (statement of Cary Sherman, Chairman & CEO, Recording Industry Association of America), and “Music Licensing Under Title 17,” Hearing Before the Subcommittee on Courts, Intellectual Property, and the Internet of the House Committee on the Judiciary, 113th Cong. (2014) (statement of David Israelite, President & CEO, National Music Publishers Association), <http://perma.cc/DCK7-V3XE>.

⁹ *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.”).

¹⁰ Yochai Benkler, “Intellectual Property and the Organization of Information Production,” *International Review of Law and Economics* 22 no. 1 (2002): 81-107; Gideon Parchomovsky & R. Polk Wagner, “Patent Portfolios,” *University of Pennsylvania Law Review* 154 no. 1 (2005): 1-78.

¹¹ The case that best encapsulates the older, more restrictive approach is the “Sam Spade” case: *Warner Brothers Pictures, Inc. v. Columbia Broad. Sys.*, 216 F.2d 945 (9th Cir. 1954), *cert. denied*, 348 U.S. 971 (1955). Representative examples of the newer, lenient approach include *Warner Brothers Entertainment v. X One X Productions*, 644 F.3d 584 (8th Cir. 2011); *Gaiman v. McFarlane*, 360 F.3d 644 (7th Cir. 2004).

¹² On enablement, see Dan L. Burk & Mark A. Lemley, “Is Patent Law Technology-Specific?,” *Berkeley Technology Law Journal* 17 no. 4 (2000): 1155-1206; Dan L. Burk, “Patent Silences,” *Vanderbilt Law Review* 69 no. 6 (2016): 1603-1630. On strategic disclosure, see Douglas Lichtman, Scott Baker, & Kate Kraus, “Strategic Disclosure in the Patent System,” *Vanderbilt Law Review* 53 no. 6 (2000): 2175-2218; Gideon Parchomovsky, “Publish or Perish,” *Michigan Law Review* 98 no. 4 (2000): 926-952.

¹³ See, for example, Patrina Ozurumba, “Information Under-Load: Rethinking IP Valuation in the Context of U.S. Securities Regulation,” *Journal of Law and Business Ethics* 19 no. 1 (2013): 89-104; Jerold L. Zimmerman, “The Role of Accounting in the 21st Century Firm,” *Accounting and Business Research* 45 no. 4 (2015): 485-509; Charles Hodges & Lynn Fowler, “Tax Considerations of Acquiring Intellectual Property,” *Journal of Taxation*, Oct. 2014: 157-163; Linda M. Beale, “Reining in Intellectual Property Tax Avoidance,” *Tax Notes*, June 26, 2017, 1877-87; Ariel Glasner, “Making Something Out of ‘Nothing’: The Trend Toward Securitizing Intellectual Property Assets and the Legal Obstacles that Remain,” *Journal of Legal Technology Risk Management* 3 no. 2 (2008): 27-66.

¹⁴ Jennifer E. Rothman, “The Questionable Use of Custom in Intellectual Property,” *Virginia Law Review* 93 no. 8 (2007): 1899-1982; Daralyn J. Durie & Mark A. Lemley, “A Realistic Approach to the

Obviousness of Inventions,” *William and Mary Law Review* 50 no. 3 (2008): 989-1020; Lee Petherbridge, “On the Decline of the Doctrine of Equivalents,” *Cardozo Law Review* 31 no. 4 (2010): 1371-1406.

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- ³⁶ Sarah Burstein, “Costly Designs,” *Ohio State Law Journal* 77 no. 1 (2016): 107-158; Lee & Sunder, “The Law of Look and Feel.”
- ³⁷ James H.A. Pooley, Mark A. Lemley & Peter J. Toren, “Understanding the Economic Espionage Act of 1996,” *Texas Intellectual Property Law Journal* 5 no. 2 (1997): 177-230; James H.A. Pooley, “The Myth of the Trade Secret Troll: Why the Defend Trade Secrets Act Improves the Protection of Commercial Information,” *George Mason Law Review* 23 no. 4 (2016): 1045-78.
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