

Articles

The New Cognitive Property: Human Capital Law and the Reach of Intellectual Property

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Your knowledge is nothing if no one else knows you know it.¹

—Latin Proverb

Introduction

Contemporary law has become grounded in the conviction that not only the *outputs* of innovation—artistic expressions, scientific methods, and technological advances—but also the *inputs* of innovation—skills, experience, know-how, professional relationships, creativity, and entrepreneurial energies—are subject to control and proprietization. In other words, we now face a reality of not only the expansion of intellectual property (IP) but also “cognitive property.” The new cognitive property has emerged under the radar, commodifying intellectual intangibles that have traditionally been kept outside of the scope of intellectual property. This Article introduces the growing field of human capital law at the intersections of IP law, contract and employment law, and antitrust law and cautions against the devastating effects of the growing enclosure of cognitive capacities in contemporary markets.

Regulatory and contractual controls on human capital—postemployment restrictions, including noncompetition contracts, nonsolicitation, nonpoaching, and antidealing agreements; collusive do-not-hire talent cartels; pre-invention assignment agreements of patents, copyright, as well as nonpatentable and noncopyrightable ideas; and nondisclosure agreements, trade secret laws, and economic-espionage prosecution against former insiders—are among the fastest growing frontiers of market battles.²

1. The original Latin: *Scire tuum nihil est, nisi te scire hoc sciat alter*. Jim Russel, *Your Knowledge Is Nothing If No One Else Knows You Know It*, PAC. STANDARD, Oct. 2, 2013, <http://www.psmag.com/business-economics/knowledge-nothing-one-else-knows-know-67445>, archived at <http://perma.cc/XM4C-FBAA>; see also A NEW DICTIONARY OF QUOTATIONS FROM THE GREEK, LATIN, AND MODERN LANGUAGES 422 (Philadelphia, J.B. Lippincott & Co. 1859) (“Your own knowledge is as nothing, goes for nothing, unless others know that you possess such knowledge.”).

2. See Steven Greenhouse, *Noncompete Clauses Increasingly Pop up in Array of Jobs*, N.Y. TIMES, June 8, 2014, <http://www.nytimes.com/2014/06/09/business/noncompete-clauses-increasingly-pop-up-in-array-of-jobs.html?r=0>, archived at <http://perma.cc/ZEV2-NJ5J> (discussing the problems and benefits resulting from the widening use of noncompete clauses in employment contracts); Eric Goldman, *Congress Is Considering A New Federal Trade Secret Law. Why?*, FORBES (Sept. 16, 2014, 12:14 PM), <http://www.forbes.com/sites/ericgoldman/2014/09/16/congress-is-considering-a-new-federal-trade-secret-law-why/>, archived at <http://perma.cc/LLR2-HLAP> (analyzing new legislation that would strengthen federal trade secret law and questioning whether such legislation is necessary); Joel Rosenblatt, *Apple, Google, Intel, Adobe Settle Antitrust Hiring Case*, BLOOMBERG (Apr. 24, 2014, 11:01 PM), <http://www.bloomberg.com/news/2014-04-24/apple-google-intel-adobe-settle-antitrust-hiring-case.html>, archived at <http://perma.cc/4UBW->

Regionally and globally, these disputes heavily shape industrial competition. Through this web of extensively employed mechanisms, knowledge that has traditionally been deemed part of the public domain becomes proprietary. Pre-innovation assignment agreements regularly go beyond the subjects that IP deems commodifiable. They also regularly reach into the future, propertizing innovation that has not yet been conceived. Nondisclosure agreements span beyond traditionally defined secrets under trade secrecy laws and are routinely enforced by courts.³ Violations of secrecy requirements are also increasingly criminalized, chilling exchanges that are recognized as productive and consistent with professional norms. Noncompete agreements are now required in almost every industry and position, stymieing job mobility and information flows. Beyond the individualized agreements between firms and employees, new antitrust investigations of Silicon Valley giants, including Apple, Google, Intel, eBay, and Pixar, reveal the rise of collusive antipoaching agreements between firms. Postemployment restrictions have become so widespread that they form a cognitive property thicket that curtails efficient recruitment efforts and entrepreneurship.

While IP law restricts knowledge and information that cannot be taken out of the public domain, this delicate balance is subverted in the emerging field of human capital law. In patent law, the lines between nonpatentable abstract ideas and patentable inventions are heavily monitored. Most recently, in June 2014, the Supreme Court unanimously ruled that a computer-implemented electronic escrow service for facilitating financial transactions was ineligible for patent protection because the claims were drawn to an abstract idea rather than a patentable invention.⁴ Similarly, in copyright law, the boundaries between expressions and ideas are extensively policed to ensure that ideas themselves will not become property.⁵ And yet, this Article uncovers how the logic of IP, cautiously maintaining a balance between monopolized information and the public domain, between propertized intangibles and knowledge flow, is undermined by a second, rapidly growing layer of cognitive controls through human capital law. The

⁶FLA (discussing the settlement of a recent lawsuit against numerous technology companies for illegally colluding not to poach or solicit one another's employees).

3. See Terry Morehead Dworkin & Elletta Sangrey Callahan, *Buying Silence*, 36 AM. BUS. L.J. 151, 155 & n.20 (1998) (describing confidentiality agreements as "enhanc[ing] the noncontractual protection given trade secrets" and noting that the Uniform Trade Secrets Act allows for such agreements).

4. *Alice Corp. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2360 (2014).

5. For example, in *Harper & Row Publishers, Inc. v. Nation Enterprises*, the Supreme Court stated that "copyright's idea/expression dichotomy strike[s] a definitional balance between the First Amendment and the Copyright Act by permitting free communication of facts while still protecting an author's expression." *Harper & Row Publishers, Inc. v. Nation Enters.*, 471 U.S. 539, 556 (1985) (quoting *Harper & Row Publishers, Inc. v. Nation Enters.*, 723 F.2d 195, 203 (1983)) (internal quotation marks omitted).

expansion of controls over human capital has thus become the blind spot of IP debates.

The talent wars are heated. More than ever before, the recruitment, retention, and engagement of employees sit atop businesses' priority lists,⁶ and yet human capital law remains diffuse and murky. Analyzing the current state of human capital law against new empirical research, this Article challenges orthodox economic assumptions about the need for cognitive property, demonstrates the inadvertent harm from the unrestrained shifts toward such controls, and calls for the recognition of human capital as a shared public resource. The realities of twenty-first-century production and competition, which have changed work patterns and increased the premium on constant innovation, coincide with the accumulation of new empirical insights on innovation and knowledge creation. While these developments are of great significance, legal scholarship on human capital remains surprisingly thin. The traditional and underdeveloped analysis of human capital law views controls over human capital as necessary to generate investment and growth. At the same time, a growing body of empirical evidence indicates that excessive human capital controls have detrimental effects. Law's role in safeguarding and promoting human capital as a shared resource is little understood. A closer study of human capital law regimes suggests that the most successful regional economies have relied on legal regimes that nurture a cognitive commons, protect mobility, and encourage the densification of knowledge networks.

The Article proceeds as follows: Part I argues that the contemporary IP debates have obscured the broader ways in which knowledge and the potential to innovate are restricted. The Part presents three interrelated expansions of human capital controls. First, *subject-wise*, through agreements assigning all innovation "*whether patentable or nonpatentable; whether copyrightable or noncopyrightable*,"⁷ as well as through developments in trade secret law, the proptertization of intangible assets has expanded deep into the intangibility spectrum, enclosing knowledge that falls outside the scope of patent and copyright. The increased criminalization of trade secret protections, far more amorphously defined than other IP pillars, functions to further subvert the boundaries between protectable and nonprotectable knowledge. Second, *time-wise*, ownership has expanded to future innovation as well as attempts to go back in time and capture prior knowledge that an employee held when joining a firm. The expansion includes a rise in both pre-innovation assignment contracts, including trailer clauses, which reach into the postemployment period to assign IP ownership

6. Josh Bersin, *The Year of the Employee: Predictions for Talent, Leadership and HR Technology in 2014*, FORBES (Dec. 19, 2013, 10:10 AM), <http://www.forbes.com/sites/joshbersin/2013/12/19/ten-predictions-for-talent-leadership-and-hr-technology-in-2014/>, archived at <http://perma.cc/5N6L-CY2X>.

7. See *infra* sections I(B)(1)–(2).

back to the firm, as well as new legal constructs, including the assignor estoppel doctrine, which prevents assignors from challenging the validity of a patent. The assignor estoppel doctrine dramatically limits the defenses available to former employees who seek to compete in the industry and turns these experienced employees into legal liabilities of the new firms that recruit them. Third, *scope-wise*, recent years have witnessed a colossal rise in the use of noncompetes along with a shift from individualized controls to metacontrols—cognitive cartels—as evidenced in the ongoing antitrust class action suit against Silicon Valley high-tech giants for their no-poaching agreements.

Analyzing new empirical research on the nexus between innovation and human capital, Part II uncovers the harms of the new cognitive property by developing a novel taxonomy of different types of knowledge as they relate to human capital flows: tacit, relational, networked, motivational, and disruptive. Each aspect of knowledge helps explain the various harmful effects of the new cognitive property. The Part analyzes these effects of contemporary human capital law through the lens of new economic research about endogenous growth, labor-market search, and innovation networks, demonstrating the extent to which markets benefit from continuous investment in shared cognitive capital.

Part III argues that the rise in cognitive controls should be understood as the Third Enclosure Movement, turning human capital and intangibles of the mind—knowledge, experience, skill, creativity, and network—into property, with detrimental effects on the public domain. This Part explains these developments in relation to the ongoing shift from viewing IP through the lens of antitrust to the lens of property. The expanding lens of property into the intangibles of the mind has now reached the next frontier, enclosing not merely innovation but the potential for innovation. This Part further shows how regions that promote employee mobility encourage positive spillovers and densification of knowledge networks, which lead to economic growth and innovation, and conversely how regions that restrict employee mobility stifle growth. Finally, this Part demonstrates how the threat of litigation diminishes the quality of human capital and encourages companies to hire employees with no experience rather than seasoned employees. The new cognitive property benefits incumbent firms with superior resources and chills new market entry. The Article concludes with a call to reform human capital law from a nebulous set of harmful doctrines to a body of law committed to the promotion of innovation, knowledge flow, and economic growth.

I. Erecting Cognitive Fences: From Outputs to Inputs

A. *Human Capital Law and the Knowledge Economy*

In the past two decades, scholars from a wide variety of disciplines have warned against the overexpansion of knowledge controls through IP policy.

The debate surrounding the effects of IP laws on inventive activity and technological progress is enduring and lively. At the same time, the field of human capital—at the intersection between IP law, contract law, employment law, and antitrust—has been relatively neglected and presents urgent and fertile grounds for important inquiry on how knowledge is created, owned, distributed, and shared in contemporary economies. A closer look at human capital law reveals a dangerous expansion of controls over cognitive capacities, far beyond the bargain struck in IP law.

Nobel Laureate Elinor Ostrom, who pioneered research on economic governance, described knowledge as “a shared resource, a complex ecosystem that is a *commons*—a resource shared by a group of people that is subject to social dilemmas.”⁸ Ostrom defined knowledge as “all intelligible ideas, information, and data.”⁹ While Ostrom viewed knowledge as a shared resource, IP recognizes some forms of knowledge as privately owned. This legal conceptualization of knowledge as property is a fairly recent development, reaching its dominance around the world only in the past century.¹⁰ In ancient times, there was little formal protection for intangible goods.¹¹ Over time and most dramatically in the past few decades, notions over ownership of information and knowledge have significantly evolved. The term “intellectual property” itself did not become prevalent until the late 20th century.¹²

The drive to control information through legal tools is obvious: in its unregulated state, information travels quickly. Knowledge is, by its very nature, a public good, and it expands and multiplies without running out. Without effort, ideas flow freely. Thomas Jefferson viewed the free spread of ideas “over the globe, for the moral and mutual instruction of man, and improvement of his condition” as akin to air and fire: “[Ideas are] peculiarly and benevolently designed by nature, when she made them, like fire, expansible over all space, without lessening their density in any point, and like the air in which we breathe, move, and have our physical being, incapable of confinement or exclusive appropriation.”¹³

8. Charlotte Hess & Elinor Ostrom, *Introduction: An Overview of the Knowledge Commons, in UNDERSTANDING KNOWLEDGE AS A COMMONS* 3, 3 (Charlotte Hess & Elinor Ostrom eds., 2007).

9. *Id.* at 7.

10. See EDWARD C. WALTERSCHEID, *THE NATURE OF THE INTELLECTUAL PROPERTY CLAUSE: A STUDY IN HISTORICAL PERSPECTIVE* 39–41 (2002) (detailing the historical protection of intangible, knowledge-based property); *Intellectual Property*, STANFORD ENCYCLOPEDIA PHIL. (Sept. 22, 2014), <http://plato.stanford.edu/entries/intellectual-property>, archived at <http://perma.cc/D99U-9S4Z> (noting that recent international treaties have expanded intellectual property protections across the globe).

11. WALTERSCHEID, *supra* note 10, at 39.

12. Mark A. Lemley, *Property, Intellectual Property, and Free Riding*, 83 TEXAS L. REV. 1031, 1033–34 & tbl.1 (2005).

13. Letter from Thomas Jefferson to Isaac McPherson (Aug. 13, 1813), in *THE COMPLETE JEFFERSON* 1011, 1015 (Saul K. Padover ed., 1943).

Yet, especially in recent years, with the shift from an industrial economy to a knowledge- and service-based economy,¹⁴ ideas have enormous commercial value. For this reason, over the past few decades, IP rights have expanded in length of protection, subject matter, and scope.¹⁵ Patent eligibility has expanded to new categories, such as computer software, business methods, and genetically modified organisms.¹⁶ Lawmakers have expanded and lengthened copyright protections.¹⁷ Trademark law now protects the value of the brand beyond the logo and beyond the original purpose of preventing consumer confusion.¹⁸ Trade secret law spans new subject matters and modes of infringement.¹⁹ Together, this body of law has been hailed “the foundation of the modern information economy. It fuels the software, life sciences, and computer industries, and pervades most other products we consume.”²⁰ But as the scope of IP protection has expanded, the field has also become one of the most contested areas of policy. From music-file sharing to broadcasting, from drugs for AIDS to patent trolls, “[t]he intellectual property wars are on.”²¹

The fierce battles over the proper scope of IP law raise questions about the costs and benefits of controlling knowledge and the distributional effects of the current legal regime. IP rights are generally understood as a “carefully

14. See generally Joseph E. Stiglitz, *The Book of Jobs*, VANITY FAIR, Jan. 2012, <http://www.vanityfair.com/politics/2012/01/stiglitz-depression-201201>, archived at <http://perma.cc/YZW6-P877> (discussing the current transition from an industrial economy to a service-based economy).

15. See WALTERSCHEID, *supra* note 10, at 296, 300; Andrew Beckerman-Rodau, *The Problem with Intellectual Property Rights: Subject Matter Expansion*, 13 YALE J.L. & TECH. 35, 88 (2010).

16. Joshua D. Sarnoff, *Patent-Eligible Inventions After Bilski: History and Theory*, 63 HASTINGS L.J. 53, 119 (2011); Jacob S. Sherkow, *The Natural Complexity of Patent Eligibility*, 99 IOWA L. REV. 1137, 1139 (2014).

17. Sonny Bono Copyright Term Extension Act, Pub. L. No. 105-298, § 102, 112 Stat. 2827, 2827–28 (1998) (codified as amended at 17 U.S.C. §§ 301–304 (2012)); Beckerman-Rodau, *supra* note 15, at 63–64.

18. Michael A. Johnson, *The Waning Consumer Protection Rationale of Trademark Law: Overprotective Courts and the Path to Stifling Post-Sale Consumer Use*, 101 TRADEMARK REP. 1320, 1322 (2011); Mark A. Lemley & Mark McKenna, *Irrelevant Confusion*, 62 STAN. L. REV. 413, 414 (2010); Note, *The Devil Wears Trademark: How the Fashion Industry Has Expanded Trademark Doctrine to Its Detriment*, 127 HARV. L. REV. 995, 995–96 (2014).

19. ORLY LOBEL, TALENT WANTS TO BE FREE: WHY WE SHOULD LEARN TO LOVE LEAKS, RAIDS, AND FREE RIDING 106 (2013).

20. Nancy Gallini & Suzanne Scotchmer, *Intellectual Property: When Is It the Best Incentive System?*, in 2 INNOVATION POLICY AND THE ECONOMY 51, 51 (Adam B. Jaffe et al. eds., 2002).

21. Gaia Bernstein, *In the Shadow of Innovation*, 31 CARDOZO L. REV. 2257, 2262 (2010). The Supreme Court has heard a substantial number of cases relating to patents, copyrights, or trademarks over the past two terms alone. See, e.g., *Am. Broad. Cos. v. Aereo, Inc.*, 134 S. Ct. 2498 (2014) (relating to copyright); *Alice Corp. v. CLS Bank Int'l*, 134 S. Ct. 2347 (2014) (relating to patent); *Nautilus, Inc., v. Biosig Instruments, Inc.*, 134 S. Ct. 2120 (2014) (relating to patent); *Petrella v. Metro-Goldwyn-Mayer, Inc.*, 134 S. Ct. 1962 (2014) (relating to copyright); *Medtronic, Inc. v. Mirowski Family Ventures, LLC*, 134 S. Ct. 843 (2014) (relating to patent); *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107 (2013) (relating to patent); *Already, LLC v. Nike, Inc.*, 133 S. Ct. 721 (2013) (relating to trademark).

crafted bargain.”²² The bargain is quid pro quo: inputs to innovation are rewarded with exclusivity over certain outputs of innovation for a limited time.²³ The prevailing consensus is that IP protections themselves are mostly harmful, but the incentive system they create is valuable.²⁴ In other words, IP law is a necessary evil: it promotes innovation by creating a temporary monopoly.²⁵ The debates normally surround the scope of enclosure and the limits of this necessary evil.²⁶ Increasingly, scholars believe that the contours of this bargain have exceeded their limits. A decade ago, a group of scholars and activists denounced “excessive, unbalanced or poorly designed intellectual property protections” when they drafted an open letter to the director-general of the World Intellectual Property Organization (WIPO).²⁷ The letter called for updated approaches to knowledge building and sharing.²⁸ Since then, the quest to reach the right balance between public domain and IP protections has only intensified. In March 2013, the central provisions of the America Invents Act, the first major patent law reform since 1952, went into effect.²⁹ Currently, several major patent, trade secrets, and copyright reform bills are before Congress.³⁰

22. *Dastar Corp. v. Twentieth Century Fox Film Corp.*, 539 U.S. 23, 33 (2003) (quoting *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 150 (1988)) (internal quotation marks omitted).

23. See Mark A. Lemley, *Ex Ante Versus Ex Post Justifications for Intellectual Property*, 71 U. CHI. L. REV. 129, 131 (2004) (noting that under the “classic incentive story,” creators are granted exclusive rights over their works, permitting creators to control the price and availability of their works).

24. See *id.* (describing the negative effects of IP protections—stifling downstream innovation and decreasing the number of consumers who can afford the protected works—and noting that these effects are designed to incentivize creation).

25. *Id.*

26. A growing but significant minority of commentators advocate against intellectual property as an unnecessary evil that ultimately reduces access and slows down progress in the arts and sciences. See generally MICHELE BOLDRIN & DAVID K. LEVINE, *AGAINST INTELLECTUAL MONOPOLY* (2008).

27. Declan Butler, *Drive for Patent-Free Innovation Gathers Pace*, 424 NATURE 118, 118 (2003).

28. *Id.*

29. David Goldman, *Patent Reform Is Finally on Its Way*, CNN MONEY (June 24, 2011, 11:05 AM), http://money.cnn.com/2011/06/24/technology/patent_reform_bill/index.htm, archived at <http://perma.cc/M47B-PUEK>; *Leahy-Smith America Invents Act Implementation*, USPTO, http://www.uspto.gov/aia_implementation, archived at <http://perma.cc/D8UA-MEVW>. For the content of the act itself, see Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (codified as amended in scattered sections of 28 U.S.C. and 35 U.S.C.).

30. See, e.g., Saving High-Tech Innovators from Egregious Legal Disputes Act of 2013, H.R. 845, 113th Cong. (2013) (providing “for the recovery of patent litigation costs, and for other purposes”). Currently, there are multiple bills before Congress aimed at strengthening trade secret protections. See, e.g., Deter Cyber Theft Act of 2014, S. 2384, 113th Cong. (2014) (proposing safeguards to deter international trade secret theft in cyberspace); Defend Trade Secrets Act of 2014, S. 2267, 113th Cong. (2014); Private Right of Action Against Theft of Trade Secrets Act of 2013, H.R. 2466, 113th Cong. (2013); Press Release, Senator Sheldon Whitehouse, Whitehouse and Graham Working to Crack Down on Economic Espionage (July 29, 2013), available at <http://www.whitehouse.senate.gov/news/release/whitehouse-and-graham-working-to-crack-down-on-economic-espionage>, archived at <http://perma.cc/XH4G-PBP2> (describing a proposed draft of

While the scope of IP has triggered lively disputes and exchanges as well as intense, ongoing efforts by legislatures and courts to strike the right balance, these debates have overshadowed a deeper expansion into the world of intangible goods. Under the radar, excessive, unbalanced, poorly designed (to borrow the language of the WIPO letter) human capital controls have wildly expanded and are widespread in almost every industry.³¹ And yet, strikingly, their expansion has been largely neglected in the IP wars. These contractual and regulatory constraints on the use of knowledge, skill, and information acquired during employment consist of (1) pre-innovation assignment agreements that go beyond the subjects and timeline that IP deems commodifiable; (2) nondisclosure agreements and secrecy restrictions, which span beyond traditionally defined secrets under trade secret law, as well as the increased criminalization of secrecy infringement; (3) airtight noncompete agreements; (4) postemployment career restrictions, including antisolicitation and nondealing clauses; and (5) most recently, meta-noncompetes: anticompetitive labor-market collusion through multilateral antipoaching agreements. Each of these central mechanisms, vigorously employed by companies to propertize human capital, is subject to doctrinal rules and litigation but has received surprisingly little attention as a field of law.

B. *The Intangible Spectrum*

1. *Evan Brown's Abstract Solution: "Whether Patentable or Non-patentable."*—Eureka! The sudden realization of a solution to a problem. Evan Brown, a computer programmer from Texas, claimed to have experienced such a flash of genius one weekend while driving.³² Brown claimed that at that moment the problem he had been trying to solve for over two decades, an abstract algorithm that would be the basis of adapting old software to new hardware, had come to him.³³ Brown was an employee at the technical-support department of the telecommunications company DSC Communications, now known as Alcatel USA.³⁴ At the beginning of his employment, Brown signed an innovation assignment clause with Alcatel assigning Alcatel "full legal right, title and interest" in any future

legislation intended to "help prosecutors crack down on economic espionage and trade-secret theft"). For further discussion of pending congressional acts concerning intellectual property rights, see Joshua Sibble, *International Trend Toward Strengthening Trade Secret Law*, INTELL. PROP. & TECH. L.J., Apr. 2014, at 18, 18–19.

31. Greenhouse, *supra* note 2.

32. This example is adapted from LOBEL, *supra* note 19, at 141–44.

33. Dan Michalski, *Street Talk: Who Owns Your Brain?*, D MAG., June 2001, <http://www.dmagazine.com/publications/d-magazine/2001/june/street-talk-who-owns-your-brain>, archived at <http://perma.cc/7WSX-MPF7>.

34. *Brown v. Alcatel USA, Inc.*, No. 05-02-01678-CV, 2004 WL 1434521, at *3 (Tex. App.—Dallas June 28, 2004, no pet.) (mem. op., not designated for publication).

inventions,³⁵ including transfer of “all information concerning any discoveries or inventions he made or conceived while in its employ which related to the nature of the company’s business.”³⁶ When Brown made his discovery, he attempted to negotiate a deal to share the profits of the “Solution,” as it would be called in court, with Alcatel.³⁷ Alcatel instead fired him and sued for full ownership over the Solution.³⁸ After seven years of litigation, a Texas court ruled in favor of Alcatel, holding that Brown’s algorithms belonged to his former employer.³⁹ The Texas court found that the Solution was an invention or conception falling under the terms of the employment agreement and that the employment contract applied to the Solution because Alcatel was in a business related to the Solution and that “one of Brown’s job functions was to manually convert Alcatel’s existing low-level code to high-level code.”⁴⁰ The practical result was that Brown, postemployment and postlitigation, commuted for several months to Alcatel’s offices and programed the Solution he had conceived in his mind, all without compensation.⁴¹

Brown’s case became a symbol of the outrage felt by inventors required to hand over their innovations to their former employers.⁴² Scott Adams created a Dilbert strip about Brown’s all-too-common experience, showing an employee asked to “cough up his idea.”⁴³ Brown’s story is far from unique. Pre-invention assignment clauses are pervasive and standard across many industries and jobs.⁴⁴ While individual inventors develop patented inventions, the vast majority of the patents submitted to the U.S. Patent and Trademark Office (USPTO) are submitted by corporations.⁴⁵ And yet, despite this pervasive assignment practice, the outrage that Brown’s case triggered was particularly acute in part because the Solution existed entirely in Brown’s mind and was merely an intangible idea in incubation. From a temporal perspective, the Solution reflects the product of Brown’s life work, spanning a career far richer than the decade of work at Alcatel. Even more

35. LOBEL, *supra* note 19, at 142; *see also Brown*, 2004 WL 1434521, at *3.

36. *Id.* at *1.

37. Michalski, *supra* note 33.

38. *Id.*

39. *Brown*, 2004 WL 1434521, at *3, *5.

40. *Id.*

41. LOBEL, *supra* note 19, at 142; *accord Michalski*, *supra* note 33.

42. *See, e.g.*, Jeff Nachtigal, *We Own What You Think*, SALON (Aug. 18, 2004, 2:30 PM) http://www.salon.com/2004/08/18/evan_brown/, *archived at* <http://perma.cc/XF6Z-DK7U> (chronicling Brown’s legal dispute and noting concerns raised by the Court’s decision).

43. LOBEL, *supra* note 19, at 143 fig.7.1.

44. David J. Brody, *Employee Invention Assignment Agreements: Issues in Getting Them Right*, HAMILTON BROOK SMITH REYNOLDS (June 2011), http://www.hbsr.com/news_events/148-employee-invention-assignment-agreements-issues-getting-them-right, *archived at* <http://perma.cc/5S33-USD9>.

45. U.S. PATENT & TRADEMARK OFFICE, ALL TECHNOLOGIES REPORT: JANUARY 1, 1989–DECEMBER 31, 2013, at A1-2 (2014).

generally, the sense of wrong may come from the common practice of requiring employees to forfeit all future innovation through assignment agreements, effectively restricting them from later pursuing independent career paths, notwithstanding the fact that they were not hired to invent.

In the *Brown* case, the judge analyzed the case from a pure contractual perspective.⁴⁶ The judge explained that the contract was a valid one because “Brown’s continued employment was conditioned on his signing the employment agreement.”⁴⁷ The court stated that Brown’s contract with Alcatel was enforceable because “[t]he continued employment and payment of salary, which would not have occurred but for Brown signing the employee agreement, was Alcatel’s performance under the unilateral contract,” and a unilateral contract “becomes enforceable if the party seeking to enforce the contract has performed, conferring even a remote benefit on the other party.”⁴⁸ “[The court] ordered complete disclosure of the Solution to Brown’s ex-employer” and refused to apply a reasonableness analysis to invalidate the assignment contract Brown signed at Alcatel.⁴⁹

Drawing the lines between an abstract idea that cannot be owned and innovation that may become the subject of property, patent law asserts that abstract concepts that are only in their incubation stage cannot be propertized. In patent law, information is patentable only after the information is reduced to practice, has utility, and is inventive.⁵⁰ In several leading cases, the Supreme Court ruled that abstract ideas could not be patented because they are the fundamental building blocks of science and technology.⁵¹ In 2010 in *Bilski v. Kappos*,⁵² the Court held that a method for hedging risk of changing energy prices was too abstract a concept to be patentable.⁵³ This line drawing continues with the recent Supreme Court case *Alice Corp. v. CLS Bank*

46. LOBEL, *supra* note 19, at 144.

47. *Brown v. Alcatel USA, Inc.*, No. 05-02-01678-CV, 2004 WL 1434521, at *2 (Tex. App.—Dallas June 28, 2004, no pet.) (mem. op, not designated for publication).

48. *Id.*

49. LOBEL, *supra* note 19, at 144; *see also id.* at *2–3 (noting that Brown signed the agreement at the beginning of his ten-year employment with Alcatel and concluding that “the trial court properly awarded 100% of the Solution to Alcatel”).

50. *See* 35 U.S.C. § 101 (2012) (granting the right to obtain a patent on a person who “invents or discovers any new and useful process, machine, manufacture, or composition of matter”); U.S. PATENT & TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE § 2138.05 (9th ed. 2014), available at http://www.uspto.gov/web/offices/pac/mpep/documents/2100_2138_05.htm, archived at <http://perma.cc/YRD4-Q6YV> (discussing the reduction-to-practice requirement).

51. Editorial, *Abstract Ideas Don’t Deserve Patents*, N.Y. TIMES, Mar. 29, 2014, <http://www.nytimes.com/2014/03/30/opinion/sunday/abstract-ideas-dont-deserve-patents.html>, archived at <http://perma.cc/6F5P-P3KS>. On the challenges in drawing the lines between concrete and abstract patent claims, see generally Tun-Jen Chiang & Lawrence B. Solum, *The Interpretation-Construction Distinction in Patent Law*, 123 YALE L.J. 530 (2013) and Tun-Jen Chiang, *The Levels of Abstraction Problem in Patent Law*, 105 NW. U. L. REV. 1097 (2011).

52. 561 U.S. 593 (2010).

53. *Id.* at 598, 611–12.

International,⁵⁴ in which the Court unanimously decided that a computer-implemented method of mitigating risk in foreign-currency transactions was too abstract to be patentable.⁵⁵ While the specifics of line drawing continue to challenge courts and patent scholars, the efforts to draw lines are uncontested: patents are not granted to abstract concepts. Similarly, copyright law protects expressions but not abstract ideas. The idea-expression dichotomy was developed early on by the courts and later incorporated into the Copyright Act of 1976.⁵⁶ Section 102(b) of the Act states: “In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work.”⁵⁷ In other words, core IP law would not have protected Brown’s idea.

The abstract-concrete and idea-expression distinctions are the heart of the bargain struck in IP. While fine-tuning these lines remains a highly contested and frequently litigated affair, the principle that these lines ought to be policed remains strong in both copyright and patent law. And yet, when we shift our gaze from the traditional pillars of IP to contractual extensions, we uncover a completely different picture. Thus, coercing disclosure pursuant to human capital contracts at such an early stage of innovation appears technically premature, legally contradictory, and ethically harsh. Pragmatically, and indeed cynically, the legal result leads to the conclusion that Brown would have been better off quitting and pursuing the development of his idea on his own, rather than revealing the fact that he had an idea. Consequently and perversely, transferring ownership of a fledgling and individually conceived innovation impedes the move from conception to a full blueprint by disincentivizing the very person who possesses the foundational ingredients.

2. *Carter Bryant’s Concept: “Whether Copyrightable or Non-copyrightable.”*—Like Evan Brown, Carter Bryant had signed an agreement assigning all his concepts and know-how to his employer, Mattel.⁵⁸ Bryant’s employment agreement provided:

I agree to communicate to the Company as promptly and fully as practicable all *inventions* (as defined below) conceived or reduced to practice by me (alone or jointly by others) at any time during my employment by the Company. I hereby assign to the Company . . . all

54. 134 S. Ct. 2347 (2014).

55. *Id.* at 2351–52.

56. See, e.g., *Baker v. Selden*, 101 U.S. 99, 104–05 (1879) (distinguishing between the protections available for ideas described and a particular expression of those ideas); Paul Goldstein, *Infringement of Copyright in Computer Programs*, 47 U. PITT. L. REV. 1119, 1124 (1986) (noting that “the 1976 Copyright Act incorporates the [*Baker*] doctrine”).

57. 17 U.S.C. § 102(b) (2012).

58. This example is adapted from LOBEL, *supra* note 19, at 158–63.

my right, title and interest in such *inventions*, and all my right, title and interest in any patents, copyrights, patent applications or copyright applications based thereon.⁵⁹

The contract defined the term “inventions” to include, “but . . . not limited to, all discoveries, improvements, processes, developments, designs, know-how, data computer programs and formulae, *whether patentable or unpatentable*.”⁶⁰

Bryant worked as a fashion and hairstyle designer for high-end Barbie dolls at Mattel for four years.⁶¹ In 2000, Bryant pitched an idea of a new doll line, Bratz, to MGA Entertainment and immediately thereafter left Mattel to work full time on the development of the line.⁶² A year later, MGA introduced Bratz to the toy market.⁶³ Launching a \$2 billion lawsuit and decade-long litigation, Mattel sued MGA for ownership over the Bratz empire, claiming that pursuant to Bryant’s employment status and employment contract, the doll line, copyright, and trademark, and thereby all profits from its sales, belonged to Mattel.⁶⁴

In the first jury trial, the court interpreted Bryant’s employment agreement as effectively assigning all possible ideas to Mattel.⁶⁵ The court instructed the jury to merely decide “*which* ideas Bryant came up with during his time with Mattel.”⁶⁶ The trial court thereafter imposed a constructive trust over all Bratz-related trademarks⁶⁷ and awarded Mattel \$100 million stemming from the breach of Bryant’s contract.⁶⁸

On appeal, Judge Alex Kozinski turned to conventional contract interpretation in an attempt to determine whether ideas, regardless of their patentability or copyrightability, were included in the pre-invention assignment agreements. He noted the lack of the word “ideas” in the contract

59. *Mattel, Inc. v. MGA Entm’t, Inc.*, 616 F.3d 904, 909 (9th Cir. 2010) (internal quotation marks omitted).

60. *Id.* (emphasis added) (internal quotation marks omitted).

61. *Id.* at 907; *Mattel, Inc.’s Second Amended Answer* at 34, 36, *Mattel, Inc. v. MGA Entm’t Inc.*, 782 F. Supp. 2d 911 (C.D. Cal. 2011) (No. CV 04-9049).

62. *Mattel*, 616 F.3d at 907.

63. *Id.*

64. *See Mattel*, 616 F.3d at 908 (recounting that Mattel sought more than \$1 billion and ownership of the Bratz trademarks and copyrights in the lawsuit); John Kell, *Bratz Doll Maker MGA Entertainment Sues Mattel*, WALL ST. J., Jan. 13, 2014, <http://online.wsj.com/news/articles/SB10001424052702303595404579318680190603384>, archived at <http://perma.cc/S3QF-EZZ7> (noting that the complex litigation over the Bratz empire had lasted more than a decade and that the rights to the Bratz brand sought by Mattel may be worth \$2 billion).

65. *Mattel*, 616 F.3d at 909.

66. *Id.*

67. *Id.* at 908.

68. Gillian Flaccus, *Mattel Awarded \$100M in Bratz Dolls Copyright Case*, USA TODAY, Aug. 27, 2008, http://www.usatoday.com/money/industries/retail/2008-08-26-mattel-bratz-dolls_N.htm, archived at <http://perma.cc/Z5GK-S7ES> (reporting on the \$100 million awarded in total damages).

itself.⁶⁹ But he also noted the emphasis in the contract that the list was not meant to be finite.⁷⁰ Judge Kozinski thereafter compared the other categories listed against the term *ideas*: “Designs, processes, computer programs and formulae are concrete, unlike ideas, which are ephemeral and often reflect bursts of inspiration that exist only in the mind. On the other hand, the agreement also lists less tangible inventions such as ‘know-how’ and ‘discoveries.’”⁷¹

Judge Kozinski further inquired on the right method to interpret the contract by emphasizing the contractual word “conceived,” which he interpreted as suggesting that “Bryant may have conveyed rights in innovations that were not embodied in a tangible form by assigning inventions he ‘conceived’ as well as those he reduced to practice.”⁷² Judge Kozinski sent these inquiries back for a second jury trial that would look into the contract interpretation more carefully.⁷³ In other words, Judge Kozinski, in overturning the first jury trial, supported a better drafted contract that could fence up all ideas, abstract and ephemeral.

Strikingly, in the very same decision, Judge Kozinski warned about the chilling effect of overly broad copyright protection. As we have come to expect from the judge’s significant lineage of intellectual property holdings,⁷⁴ Judge Kozinski was well aware of the threat that strong controls over information pose to innovation and creativity. When he turned to the actual drawings of the Bratz dolls that Bryant had sketched and sold to MGA, he emphasized the idea-expression distinction at the core of copyright law: “Degas can’t prohibit other artists from painting ballerinas, and Charlaine Harris can’t stop Stephenie Meyer from publishing *Twilight* just because

69. *Mattel*, 616 F.3d at 909.

70. *Id.*

71. *Id.*

72. *Id.*

73. *See id.* at 909–10 (finding the contract to be ambiguous and ordering the district court to consider the contract’s interpretation on remand). The Ninth Circuit remanded the Bryant case and the district court ultimately ordered a new trial. *Mattel, Inc. v. MGA Entm’t, Inc.*, 782 F. Supp. 2d 911, 942 (C.D. Cal. 2011). On the eve of the first trial, Mattel entered into a settlement agreement with Bryant, thus leaving claims against MGA that included intentional interference with contract, aiding and abetting breach of fiduciary duty, and copyright infringement. *Id.* at 941. Various counterclaims were filed by both parties, including claims against each other for trade secret misappropriation. *Mattel, Inc. v. MGA Entm’t, Inc.*, 705 F.3d 1108, 1109 (9th Cir. 2013). In 2011, the district court rendered judgment on the merits pursuant to a jury verdict that awarded MGA more than \$80 million in damages. *Id.* at 1110. The district court then “awarded MGA an equal amount in exemplary damages” and “awarded trade-secret attorneys’ fees and costs.” *Id.* Also, “because the jury found for MGA on Mattel’s copyright claim,” MGA was awarded attorneys’ fees and costs under the Copyright Act. *Id.* On appeal, the Ninth Circuit vacated the verdict for MGA’s trade secret claim as well as the related damages, fees, and costs. *Id.* at 1110–11. The Ninth Circuit did affirm the district court’s award of fees and costs to MGA under its Copyright Act claim. *Id.* at 1111.

74. *See, e.g., White v. Samsung Elecs. Am., Inc.*, 989 F.2d 1512, 1513 (9th Cir. 1993) (Kozinski, J., dissenting) (introducing Judge Kozinski’s much-quoted statement that “[o]verprotecting intellectual property is as harmful as underprotecting it”).

Sookie came first. Similarly, MGA was free to look at Bryant's sketches and say, 'Good idea! We want to create bratty dolls too.'"⁷⁵

And yet, the same decision gives a well-drafted contract the power to preassign far more than what is, as expressly stated in the contract, patentable or copyrightable. This gap between the scope of intellectual property and the scope of contractual pre-innovation assignment is illuminating. Substantively, intellectual property only protects a narrow set of information, excluding abstract concept and ideas, while the human capital cases expand the disputes into these unprotectable forms of knowledge.

The explicit subversion of the lines drawn in patent and copyright law in the drafting of assignment agreements is increasingly standard. Google, for example, requires its employees to sign an assignment agreement that defines "inventions" to include "inventions, designs, developments, ideas, concepts, techniques, devices, discoveries, formulae, processes, improvements, writings, records, original works of authorship, trademarks, trade secrets, all related know-how, and any other intellectual property, *whether or not patentable or registerable under patent, copyright, or similar laws.*"⁷⁶ Both the patent-assignment dispute over Evan Brown's algorithm and the copyright dispute over Bryant's concept of Bratz illustrate the way the bargain struck in intellectual property law has been subverted in human capital law. The standard human capital agreements create a new form of cognitive property, commodifying and assigning ownership over abstract ideas that would otherwise be deemed part of the public domain.

3. *Sergey Aleynikov's Crime: Secrecy Hysteria as a Control Device.*—

Why exploit the ignorance of both the general public and the legal system about complex financial matters to punish this one little guy?
Why must the spider always eat the fly?⁷⁷

—Michael Lewis

Sergey Aleynikov was a star programmer at Goldman Sachs.⁷⁸ A month after leaving Goldman Sachs to work for a new company, Teza Technologies, he was arrested by the Federal Bureau of Investigation (FBI), and later prosecuted and convicted under the Economic Espionage Act (EEA) for stealing proprietary technology.⁷⁹ Goldman had accused Aleynikov of

75. *Mattel*, 616 F.3d at 913.

76. Google Inc., At-Will Employment, Confidential Information, Invention Assignment and Arbitration Agreement (Cal. ed. Mar. 2014) (on file with author) [hereinafter Google Employment Contract] (emphasis added).

77. Michael Lewis, *Did Goldman Sachs Overstep in Criminally Charging Its Ex-Programmer?*, VANITY FAIR, Sept. 2013, <http://www.vanityfair.com/business/2013/09/michael-lewis-goldman-sachs-programmer>, archived at <http://perma.cc/9F97-YGXG>.

78. *Id.*

79. *Id.*

stealing computer code and sending himself thirty-two megabytes of source code.⁸⁰ Immediately upon discovering the downloads, Goldman notified the FBI, which promptly sent agents to arrest Aleynikov.⁸¹ Aleynikov was sentenced to eight years in federal prison.⁸²

Aleynikov worked as a programmer for Goldman's high-frequency trading platform where he, like other programmers, used open-source software on a daily basis.⁸³ Unlike the frequently practiced requirement of putting open-source code back to the common pool after use and modification, Goldman had a one-way attitude about open source.⁸⁴ When Goldman programmers took open source, it became Goldman's proprietary information.⁸⁵ Goldman would not return the adjusted code to public domain, likely in violation of the open-source licensing agreements.⁸⁶ Journalist Michael Lewis, who investigated this case, described Aleynikov's experience at Goldman, where Aleynikov used open-source components to program new solutions.⁸⁷ Aleynikov asked his boss if he could release the repackaged open source back on the Internet and his boss told him it was now Goldman's property.⁸⁸ As Lewis described:

Open source was an idea that depended on collaboration and sharing, and Serge [Aleynikov] had a long history of contributing to it. He didn't fully understand how Goldman could think it was O.K. to benefit so greatly from the work of others and then behave so selfishly toward them. "You don't create intellectual property," he said. "You create a program that does something."⁸⁹

The core logic of the open-source initiative is that rewriting code from scratch for every new program is an utter waste of time,⁹⁰ analogous to recreating mathematical proofs rather than using a calculator in every market transaction. During Aleynikov's trial, his attorney presented evidence of identical pages of computer code: one marked with an open-source license and the other a Goldman's copy "with the open-source license [removed] and replaced with a Goldman Sachs license."⁹¹

80. *Id.*

81. *Id.*

82. *Id.*

83. *Id.*

84. *Id.*

85. *Id.*

86. *Id.*; cf. Christian H. Nandan, *Open Source Licensing: Virus or Virtue?*, 10 TEX. INTELL. PROP. L.J. 349, 361 (2002) (noting that one concern with some open-source license provisions is that they do not adequately protect against users taking the code private for commercial purposes).

87. Lewis, *supra* note 77.

88. *Id.*

89. *Id.*

90. Joel Spolsky, *Things You Should Never Do, Part I*, JOEL ON SOFTWARE (Apr. 6, 2000), <http://www.joelonsoftware.com/articles/fog0000000069.html>, archived at <http://perma.cc/LX9C-ENWE>.

91. Lewis, *supra* note 77.

When Aleynikov quit his position at Goldman he agreed to remain in his position for six more weeks to help train others at Goldman and teach them what he knew.⁹² During that time, he mailed himself source code he had been working on that contained large amounts of the open-source code he had been using for two years intertwined with code he developed at Goldman.⁹³ He later claimed that he sent this code to himself because he hoped to disentangle the two and have the open source available if he needed a reminder of what he had used.⁹⁴

There is no doubt that Aleynikov broke Goldman Sachs' rules. There is also no doubt that employees are generally required to not divulge a company's secrets.⁹⁵ The claim here is that trade secret law, like other areas of intellectual property, is a bargain between encouraging investment in innovation by protecting certain information and stimulating market competition by ensuring the use and dissemination of other information.⁹⁶ Traditionally then, trade secret law, like other forms of IP, has boundaries: information deemed a trade secret must be confidential, valuable, not generally known in the industry, and the company must exert reasonable efforts in maintaining its secrecy.⁹⁷ And yet while trade secret law, like other pillars of IP, is designed to promote innovation, it functions to regulate the relationship between firms and individuals.⁹⁸

Using the lens of human capital, contemporary trade secrets have expanded both in *subject matter*, the type of information that can be deemed trade secret, and *protection*, the type of activities that are deemed misappropriation. The *Aleynikov*⁹⁹ case illuminates both these trends toward cognitive property through recent developments in trade secret law, raising doubt about whether the original bargain struck in trade secrecy has been abandoned. In several ways, the case points to unbalanced controls over information beyond the actual secrecy of the information at stake. First, the evidence in the case pointed to the little value that the source code would have for anyone outside of Goldman. While Goldman's system was an

92. *Id.*

93. *Id.*

94. *Id.*

95. See Orly Lobel, *Intellectual Property and Restrictive Covenants*, in LABOR AND EMPLOYMENT LAW AND ECONOMICS 517, 523–26 (Kenneth G. Dau-Schmidt et al. eds., 2d ed. 2009) (discussing trade secret doctrine, including that employees are not permitted to divulge firm-specific knowledge unless it is public).

96. See generally Mark A. Lemley, *The Surprising Virtues of Treating Trade Secrets as IP Rights*, 61 STAN. L. REV. 311, 329–41 (2008) (explaining “the two critical features that trade secrets share with other IP rights—they promote inventive activity and they promote disclosure of inventions”—and analyzing the balance between secrecy and disclosure required to promote those two goals).

97. *Id.* at 317.

98. Madhavi Sunder, *Trade Secret and Human Freedom*, in INTELLECTUAL PROPERTY AND THE COMMON LAW 334, 335 (Shyamkrishna Balganeshe ed., 2013).

99. *United States v. Aleynikov*, 676 F.3d 71 (2d Cir. 2012).

archaic patchwork, newer and faster systems were designed differently.¹⁰⁰ Second, there was no actual use of the information taken. The only evidence presented in the case was testimony by Aleynikov's new employer that he had absolutely no interest in or use for the code.¹⁰¹ Rather, the new employer wanted to build something from scratch and testified that "[e]ven if [he were] offered Goldman's entire high-frequency-trading platform he would not have been interested."¹⁰² Third, much of the code was open-source code that Aleynikov had taken from the Internet. He insisted convincingly to the panel of experts who examined the evidence posttrial that he took the code for those elements.¹⁰³ For programmers like Aleynikov, the code is analogous to the pocketbook inventors used to carry around everywhere. One of the experts considering the evidence post-conviction explained:

In [Serge Aleynikov's] case, think of being at a company for three years and you carry a spiral notebook and write everything down. Everything about your meetings, your ideas, products, sales, client meetings—it's all written down in that notebook. You leave for your new job and take the notebook with you (as most people do). The contents of your notebook relate to your history at the prior company, but have very little relevance to your new job. You may never look at it again. Maybe there are some ideas or templates or thoughts you can draw on. But that notebook is related to your prior job, and you will start a new notebook at your new job which will make the old one irrelevant. . . . [It enables them] to remember what they worked on—but it has very little relevance to what they will build next.¹⁰⁴

Fourth, the manner in which Aleynikov downloaded the code was not that of an inconspicuous thief, as he e-mailed it to himself from work when he could have easily downloaded the information onto a thumb drive.¹⁰⁵ Fifth, and perhaps most compelling, Aleynikov took very little, "eight megabytes in a platform that consisted of an estimated one gigabyte of code," and nothing of true value, namely Goldman's trading strategies—the "secret sauce."¹⁰⁶ Sixth, procedurally, these questions were tried in the absence of actual expertise about the nature of the information and the allegations of its value.¹⁰⁷ Both the FBI investigators who arrested Aleynikov and the jury

100. Lewis, *supra* note 77.

101. *Id.*

102. *Id.*

103. *Id.*

104. *Id.* The expert contrasted these actions with real theft: "If Person A steals a bike from Person B, then Person A is riding a bike to school, and Person B is walking. A is better off at the expense of B. That is clear-cut and most people's view of theft." *Id.*

105. *Id.*

106. *Id.* As one expert described it: "But that's like stealing the jewelry box without the jewels." *Id.*

107. The one outside expert witness in the trial called by the government turned out rather to be a non-expert:

who convicted him seemed to have little grasp of the world of high-frequency trading and its trade secrets. Finally, the harsh consequences: the eight-year imprisonment of a former programmer (a father of three with no criminal record) for the act, common among programmers, of e-mailing his work to himself.¹⁰⁸

In his new book, *Flash Boys*, Michael Lewis attempted to understand why Goldman fought pugnaciously under such nonthreatening circumstances to make sure that a former star programmer would be sentenced to jail.¹⁰⁹ Lewis asked: “Why on earth call the F.B.I.? Why coach your employees to say what they need to say on a witness stand to maximize the possibility of sending him to prison?”¹¹⁰

The best explanation Lewis finds is that Goldman had to send a message to shareholders, competitors, and employees that its code is original and genius.¹¹¹ If anyone discovered that 95% of it is open source, it would kill Goldman’s reputation, and the high bonuses of Goldman traders might suddenly seem less justifiable.¹¹²

A year into his imprisonment, the Second Circuit Court of Appeals reluctantly overturned Aleynikov’s sentence on technicalities.¹¹³ The court

About the market itself he was badly misinformed. (He described Goldman Sachs as “the New York Yankees” of high-frequency trading.) He turned out to have testified as an expert witness in an earlier trial involving the theft of high-frequency-trading code, after which the judge had described what he’d said as “utter baloney.”

Id. The jury was composed of high-school graduates without computer background or experience. *Id.* “‘They would bring my computer into the courtroom,’ recalls Serge incredulously. ‘They would pull out the hard drive and show it to the jury. As evidence!’ . . . [During the trial,] half the jury appeared to be sleeping.” *Id.*

108. *Id.*

109. See MICHAEL LEWIS, *FLASH BOYS* 252–54 (2014) (exploring theories into why Goldman pursued charges against Aleynikov).

110. Lewis, *supra* note 77.

111. *Id.*

112. *Id.*

113. *United States v. Aleynikov*, 676 F.3d 71, 73 (2d Cir. 2012). A few months after Aleynikov’s appeal in August 2013, the Second Circuit affirmed the criminal conviction of Samarth Agrawal for violating both the NSPA and the Economic Espionage Act (EEA) in a very similar case, where the employee was found to have misappropriated “high-frequency trading code at the time he was leaving the company.” Jennifer L. Achilles & Lina Zhou, *Virtually Identical Trade Secret Theft Cases Result in Opposite Conclusions: Lessons from the Second Circuit’s Attention to Detail*, MONDAQ (Aug. 8, 2013), <http://www.mondaq.com/unitedstates/x/256732/Terrorism+Homeland+Security+Defence/Virtually+Identical+Trade+Secret+Theft+Cases+Result+In+Opposite+Conclusions+Lessons+From+The+Second+Circuits+Attention+To+Detail>, archived at <http://perma.cc/DK7R-2GUM>. The difference between the cases was that unlike Aleynikov, Agrawal printed the code on paper, making his theft tangible. *Id.* According to the Second Circuit, “[t]his makes all the difference” under the EEA. *United States v. Agrawal*, 726 F.3d 235, 252 (2d Cir. 2013). The reason for the court’s decision, as the court itself pointed out, was the fact that Congress amended the EEA in response to the Aleynikov case so that the statute would be broadly construed to protect against the theft of trade secrets. *Id.* at 244 n.7. Although the Court found that the cases were identical in “moral culpability,” it stated, “it is Congress’s task, not the courts’, to define crimes and prescribe punishments.” *Id.* at 253.

found that the two statutes used for his conviction had loopholes.¹¹⁴ The National Stolen Property Act (NSPA) was written to cover only “goods, wares, merchandise, securities or money,” not intangible goods, while the EEA covered the misappropriation of trade secrets that were designed to enter into interstate commerce.¹¹⁵ Since Aleynikov did not remove anything physically out of Goldman’s offices, the NSPA did not apply.¹¹⁶ Because Goldman’s code was used internally and not for sale, the court ruled that it did not meet the EEA’s interstate commerce requirement.¹¹⁷

In his concurring opinion, Judge Guido Calabresi called Congress to amend the EEA to cover the kind of information Aleynikov downloaded.¹¹⁸ Congress quickly reacted and closed the gap with a bipartisan vote, and President Barack Obama signed the reform into law in late December 2012.¹¹⁹ The Act added the word “service” in addition to “product,” such that it would include secrets used internally but that relate to activities, like high-frequency trading, that involve interstate commerce.¹²⁰ A month later, President Obama signed the Foreign and Economic Espionage Penalty Enhancement Act, which enhances the penalties under the EEA.¹²¹ Meanwhile, the *Aleynikov* case has been transferred to New York state

114. *Aleynikov*, 676 F.3d at 76; Lewis, *supra* note 77. Aleynikov is still being charged in New York state court for unlawful use of secret scientific material and unlawful duplication of computer-related material, facing a four-year prison sentence. Peter Lattman, *Former Goldman Programmer Is Arrested Again*, DEALBOOK, N.Y. TIMES (Aug. 9, 2012, 5:06 PM), <http://dealbook.nytimes.com/2012/08/09/ex-goldman-programmer-is-arrested-again/>, archived at <http://perma.cc/L65E-L4EB>. He is currently on bail. *Id.* Aleynikov challenged the charges on double jeopardy grounds; the judge found that the charges were different and that the federal charges were dismissed based on the inadequacy of the indictment and not the evidence, therefore not constituting double jeopardy. Jonathan Stempel, *Former Goldman Programmer Fails to Win Dismissal of Code Theft Case*, REUTERS, Apr. 30, 2013, available at <http://www.reuters.com/article/2013/04/30/us-goldman-aleynikov-idUSBRE93T16E20130430>, archived at <http://perma.cc/QR5V-D8WV>. More recently, Aleynikov filed a complaint in September 2012, seeking costs for his legal fees as a former corporate officer. Sophia Pearson, *'Flash Boys' Programmer Loses in Goldman Fight over Fees*, BLOOMBERG (Sept. 2, 2014, 12:37 PM), <http://www.bloomberg.com/news/2014-09-03/ex-goldman-programmer-s-legal-fee-advance-rejected.html>, archived at <http://perma.cc/3R2E-YAGY>. The fees amount to more than \$2.4 million. *Id.* Aleynikov recently scored a major victory. A New York state court declared that his initial arrest was illegal and that the prosecution could not use the evidence gathered from the arrest and subsequent searches. Ben Protess, *Judge Blocks Evidence in Goldman Code Theft Case*, DEALBOOK, N.Y. TIMES (June 20, 2014, 8:20 PM), http://dealbook.nytimes.com/2014/06/20/judge-throws-out-evidence-in-sergey-aleynikovs-code-theft-case/?_php=true&_type=blogs&_r=0, archived at <http://perma.cc/E72B-G2LF>.

115. *Aleynikov*, 676 F.3d at 76, 79; see also 18 U.S.C. §§ 1832, 2314 (2006).

116. See *Aleynikov*, 676 F.3d at 77 (“We join other circuits in relying on *Dowling* for the proposition that the theft and subsequent interstate transmission of purely intangible property is beyond the scope of the NSPA.”).

117. *Id.* at 82.

118. *Id.* at 83 (Calabresi, J., concurring).

119. For the act itself, see Theft of Trade Secrets Clarification Act of 2012, Pub. L. No. 112-236, 126 Stat. 1627 (codified at 18 U.S.C. § 1832 (2012)).

120. *Id.* § 2, 126 Stat. at 1627.

121. Foreign and Economic Espionage Penalty Enhancement Act of 2012, Pub. L. No. 112-269, § 2, 126 Stat. 2442, 2442 (2013) (codified at 18 U.S.C. § 1831 (2012)).

prosecutors and Aleynikov is currently being criminally charged under state trade secret law for the “unlawful use of secret scientific material” and “unlawful duplication of computer related material,” based on a signed complaint by the same federal agent who led the investigation of the federal prosecution.¹²²

The criminalization of trade secret law is particularly disturbing when understood in the context of the expansion of trade secret subject matter. The EEA defines “trade secret” very broadly to include:

[A]ll forms and types of financial, business, scientific, technical, economic, or engineering information, including patterns, plans, compilations, program devices, formulas, designs, prototypes, methods, techniques, processes, procedures, programs, or codes, whether tangible or intangible, and whether or how stored, compiled, or memorialized physically, electronically, graphically, photographically, or in writing¹²³

Under the Uniform Trade Secrets Act, adopted by most states, the definition of a trade secret is also very broad.¹²⁴ Just as the scope of copyright and patent subject matter expands through human capital law, the type of information that is deemed secret in contemporary employment disputes frequently extends beyond what the Uniform Trade Secret Act defines as a trade secret. Some courts regularly accept the theory that under an employee’s duty of loyalty, information can be “confidential” or “proprietary” even if not a trade secret.¹²⁵ Contractually, it has become standard to include broad and open-ended lists of confidential information that goes beyond the statutory definition of trade secrets. Take for example Google’s definition of confidential information in the standard contract new recruits are required to sign:

“Google Confidential Information” means, without limitation, any information in any form that relates to Google or Google’s business and that is not generally known. Examples include Google’s non-public information that relates to its actual or anticipated business, products or services, research, development, technical data, customers, customer lists, markets, software, hardware, finances,

122. Max Stendahl, *Ex-Goldman Coder Sues Firm for \$2.4M Theft Defense Fees*, LAW360 (Sept. 26, 2012, 1:35 PM), <http://www.law360.com/articles/381717/ex-goldman-coder-sues-firm-for-2-4m-theft-defense-fees>, archived at <http://perma.cc/AYJ3-MCMS>; see also *supra* note 114.

123. Economic Espionage Act of 1996, Pub. L. No. 104-294, § 101, 110 Stat. 3488, 3488–91 (codified as amended at 18 U.S.C. § 1839(3) (2012)).

124. UNIF. TRADE SECRETS ACT § 1(4) (amended 1985), 14 U.L.A. 538 (2005); see also Charles Tait Graves, *Nonpublic Information and California Tort Law: A Proposal for Harmonizing California’s Employee Mobility and Intellectual Property Regimes Under the Uniform Trade Secrets Act*, UCLA J.L. & TECH., Fall 2006, at 1, ¶ 18 (“The UTSA is now the law in some forty jurisdictions . . .”).

125. Charles Tait Graves & Elizabeth Tippet, *UTSA Preemption and the Public Domain: How Courts Have Overlooked Patent Preemption of State Law Claims Alleging Employee Wrongdoing*, 65 RUTGERS L. REV. 59, 76–78 (2012).

employee data and evaluation, trade secrets or know-how, intellectual property rights, including but not limited to, Assigned Inventions (as defined below), unpublished or pending patent applications and all related patent rights, and user data (i.e., any information directly or indirectly collected by Google from users of its services). Google Confidential Information also includes any information of third parties (e.g., Google’s advertisers, collaborators, subscribers, customers, suppliers, partners, vendors, partners [sic], licensees or licensors) that was provided to Google on a confidential basis.¹²⁶

The contract then states that “all Google Confidential Information that I use or generate in connection with my employment belongs to Google.”¹²⁷ While some jurisdictions have stated clearly that if information is not a trade secret under the state trade secret statute the employer can have no legal interest in prohibiting its use,¹²⁸ other states allow protection of information beyond what the law deems a trade secret, including information that is public.¹²⁹ The Seventh Circuit, for example, stated that:

[I]t is unimaginable that someone who steals property, business opportunities, and the labor of the firm’s staff would get a free pass just because none of what he filched is a trade secret. . . .

. . . An assertion of trade secret in a customer list does not wipe out claims of theft, fraud, and breach of the duty of loyalty that would be sound even if the customer list were a public record.¹³⁰

Another court explained that “to the extent [a former employee] disclosed confidential information to Defendants and that information was not a ‘trade secret,’ Plaintiffs are entitled to seek redress for Defendants’ tortious interference with [the former employee’s] confidentiality contracts.”¹³¹

The web of statutes and contractual definitions made available for employers to claim secrecy has meant that confidential information becomes a catch-all category under human capital law, as employers assert ownership

126. Google Employment Contract, *supra* note 76.

127. *Id.*

128. See *Diamond Power Int’l, Inc. v. Davidson*, 540 F. Supp. 2d 1322, 1345 (N.D. Ga. 2007) (noting that, under Colorado law, “if the design of the plaintiff’s machine is not a trade secret, plaintiff has no property right in its design, and it therefore would have no claim” (quoting *Powell Products, Inc. v. Marks*, 948 F. Supp. 1469, 1475 (D. Colo. 1996))); *Hauck Mfg. Co. v. Astec Indus., Inc.*, 375 F. Supp. 2d 649, 657 (E.D. Tenn. 2004) (holding that, if the plaintiff’s allegedly stolen information is not a trade secret, “the plaintiff has no legal interest upon which to base his or her claim” of conversion).

129. See, e.g., *Ingersoll-Rand Co. v. Ciavatta*, 542 A.2d 879, 894 (N.J. 1988) (recognizing that “employers may have legitimate interests in protecting information that is not a trade secret or proprietary information, but highly specialized, current information not generally known in the industry”); MING W. CHIN ET AL., CALIFORNIA PRACTICE GUIDE: EMPLOYMENT LITIGATION ¶ 14:455 (2014) (“It is not settled whether a former employee’s use of a former employer’s confidential information that is *not protected as a trade secret* constitutes unfair competition.”).

130. *Hecny Transp., Inc. v. Chu*, 430 F.3d 402, 404–05 (7th Cir. 2005).

131. *Dow Corning Corp. v. Xiao*, 101 U.S.P.Q.2d (BNA) 1802, 1815 (E.D. Mich. 2011).

not merely over concrete information but also knowledge that has not traditionally been commodified. Coupled with the increased criminalization of the misappropriation of such knowledge, cognitive controls become airtight. While the EEA was intended primarily to fight international post-Cold War espionage,¹³² in practice the criminal provisions have targeted mostly domestic trade secret misappropriation.¹³³ The vast majority of these prosecutions have been brought against insiders, usually employees, seeking to leave their employers.¹³⁴ As the *Aleynikov* case demonstrates, the act of misappropriation under the EEA covers broad activities, including attempts with no actual harm.¹³⁵ As a result, the statute covers the types of activities employees routinely engage in throughout their careers, such as memorization of information and the disclosure of insider knowledge postemployment.¹³⁶ Many routine behaviors among workers are now criminalized. For example, according to one recent survey: “Sixty-two percent of employees think it’s acceptable to transfer corporate data to their personal computers, tablets, smartphones and cloud file-sharing apps.”¹³⁷ And yet, even routine self-storage and data backing risk qualifying as misappropriation under the EEA. Rochelle Dreyfuss described the 1996

132. See, e.g., *United States v. Hsu*, 155 F.3d 189, 194 (3d Cir. 1998) (“The end of the Cold War sent government spies scurrying to the private sector to perform illicit work for businesses and corporations . . .”).

133. See Peter J. Toren, *A Look at 16 Years of EEA Prosecutions*, LAW360 (Sept. 19, 2012, 12:18 PM), <http://www.law360.com/articles/378560/a-look-at-16-years-of-eea-prosecutions>, archived at <http://perma.cc/LTN8-N9TV> (reporting that only 9 out of 124 EEA indictments from 1996 to 2012 accused defendants of espionage assisting a foreign government). See generally R. MARK HALLIGAN, REPORTED CRIMINAL ARRESTS AND CONVICTIONS UNDER THE ECONOMIC ESPIONAGE ACT OF 1996, available at http://b-e-o-w-u-l-f.com/texts/Reported_Criminal_Arrests.pdf, archived at <http://perma.cc/FD8U-DAYQ> (surveying forty EEA criminal prosecutions from 1996 to 2003).

134. Michael L. Rustad, *The Negligent Enablement of Trade Secret Misappropriation*, 22 SANTA CLARA COMPUTER & HIGH TECH. L.J. 455, 493 (2006). During the early years of the statutes, Attorneys General normally only prosecuted after a process of private investigation by the corporation. *Id.* at 458. Currently, it appears that the Department of Justice is playing a more active role in initiating such investigations. See Quinn Emanuel Urquhart & Sullivan, LLP, *Spotlight on the Economic Espionage Act*, JDSUPRA BUS. ADVISOR (Mar. 22, 2012), <http://www.jdsupra.com/legalnews/spotlight-on-the-economic-espionage-act-20115/>, archived at <http://perma.cc/6CVT-XU5J> (stating that the FBI and DOJ have recently made investigating and prosecuting corporate trade secret theft a high priority).

135. The EEA criminalizes anyone who, merely intending to injure, “without authorization copies, duplicates, sketches, draws, photographs, downloads, uploads, alters, destroys, photocopies, replicates, transmits, delivers, sends, mails, communicates, or conveys [trade secrets].” 18 U.S.C. § 1832(a)(2) (2012).

136. See Gerald J. Mossingoff et al., *The Economic Espionage Act: A New Federal Regime of Trade Secret Protection*, 79 J. PAT. & TRADEMARK OFF. SOC’Y 191, 201–02 (1997) (bemoaning that the difficulty of distinguishing between “general knowledge” and “trade secret” may expose employees to criminal liability under the EEA).

137. Robert Hamilton, *The “Frenemy” Within—Insider Theft of Intellectual Property*, SYMANTEC (Feb. 6, 2013), http://www.symantec.com/connect/blogs/frenemy-within-insider-theft-intellectual-property?om_ext_cid=biz_socmed_twitter_facebook_marketwire_linkedin_2013Feb_worldwide_InsiderThreat, archived at <http://perma.cc/5MK6-YEN6>.

enactment of the EEA as “drastically chang[ing] the bargain between the public and the rights holder” and believed it would likely stifle innovation, though she remained hopeful that the EEA would be employed with great caution.¹³⁸ Almost two decades later, the EEA has been strengthened both in subject matter and in its criminal penalties and has expanded its reach beyond intellectual property to cognitive property.

C. *The Timeline: Back to the Future*

1. *Before: Pre-Innovation Assignments.*—Businesses increasingly seek to expand their control over the time of innovation through broad invention assignment contracts. Today, it is common for the employee–inventor to agree in advance to assign her rights of any future innovation to the employer.¹³⁹ Both the Evan Brown/Alcatel and the Bratz/Barbie disputes involved contractual claims of ownership over innovation even before the ideas made their debut inside the innovator’s mind.

If one looks only at intellectual property law on the books, innovation rights are granted to authors and inventors. The U.S. Constitution names “authors and inventors” as the beneficiaries of intellectual property rights.¹⁴⁰ Both patent law and copyright law establish, in reasonably clear terms, that ownership, as a default, is vested to the author of an invention or creative expression.¹⁴¹ The Supreme Court has repeatedly explained that IP is affixed to the belief that the “encouragement of individual effort by personal gain is the best way to advance public welfare through the talents of authors and inventors.”¹⁴² The exception that swallows the rule is at the nexus of IP, employment, and contract law. Corporations cannot author a patent, but they can nonetheless become patent owners. Similarly, corporations do not write poems or paint, but they can certainly become copyright owners. In developing the common law of patent ownership, courts adopted the hired-to-invent doctrine, under which inventions created as part of the job for which an employee was hired belong to the employer.¹⁴³ In copyright law, the work-for-hire doctrine was codified into the Copyright Act, shifting the

138. Rochelle Cooper Dreyfuss, Essay, *Trade Secrets: How Well Should We Be Allowed to Hide Them? The Economic Espionage Act of 1996*, 9 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 1, 4–6, 43 (1998). In the first years, Attorney General Janet Reno stated that any prosecution under the EEA would “require her personal approval or that of her deputy attorney general, or assistant attorney general for the criminal division.” *Id.* at 41. For further discussion of the difficulties arising out of the EEA’s broad coverage, see generally Joseph F. Savage, Jr., *I Spy: The New Economic Espionage Act Can Be Risky Business*, CRIM. JUST., Fall 1997, at 12.

139. Since the 1990s and ever increasingly, assignment agreements are required in nearly every position. Ann Bartow, *Inventors of the World, Unite! A Call for Collective Action by Employee-Inventors*, 37 SANTA CLARA L. REV. 673, 674–75 (1997).

140. U.S. CONST. art. I, § 8, cl. 8.

141. 17 U.S.C. § 201(a) (2012); 37 C.F.R. § 3.73(a) (2013).

142. *E.g.*, *Mazer v. Stein*, 347 U.S. 201, 219 (1954).

143. *Solomons v. United States*, 137 U.S. 342, 346 (1890).

definition of “authorship,” in the context of employment, from the employee to the employer that commissions the work.¹⁴⁴ These doctrines in both patent law and copyright law leave the default ownership with the employee for any innovation that has not been commissioned as part of the job.¹⁴⁵

The real devil is in contract law. Even though the legal defaults in IP law leave most innovation as employee owned—only patentable inventions and copyrightable works that were the purpose of the employee’s work are employer owned—a default is just that: the default rule can be reversed by contract. In the contemporary economy, businesses routinely require pre-innovation assignment contracts in which employees cede all rights to future inventions.¹⁴⁶ Many companies upon hiring demand the signing of such innovation clauses of all employees, from the “low-level manufacturing [employees] to design engineers and creative workers.”¹⁴⁷ Most often for a comprehensive pre-innovation assignment of all creative and inventive prospects, employees receive no other remuneration outside of their monthly salary.¹⁴⁸

At times, future-looking pre-innovation assignment agreements reach back to an employee’s past. Evan Brown claimed to have conceived of the Solution years before working for Alcatel, building on years of computer programming beginning in his college years.¹⁴⁹ Before Alcatel, Brown wrote computer-conversion programs for several different companies and began the creative process of thinking about his solution.¹⁵⁰ Similarly, Carter Bryant created designs of angelic-looking fantasy girls since his childhood, long

144. 17 U.S.C. § 201(b) (2012). The landmark victory for freelance writers was *Tasini v. New York Times Co.*, 206 F.3d 161 (2d Cir. 2000), but again, this was per the default rule that as freelancers they owned the copyright, but that loophole can be closed by contractual invention-creation assignment that freelancers now sign too. *Id.* at 166.

145. See *supra* note 141 and accompanying text.

146. Peter Caldwell, *Employment Agreements for the Inventing Worker: A Proposal for Reforming Trailer Clause Enforceability Guidelines*, 13 J. INTELL. PROP. L. 279, 284–85 (2006).

147. Orly Lobel, Op-Ed., *My Ideas, My Boss’s Property*, N.Y. TIMES, Apr. 13, 2014, http://www.nytimes.com/2014/04/14/opinion/my-ideas-my-bosss-property.html?_r=0, archived at <http://perma.cc/9SEQ-X4ZN>.

148. *Id.*; Steven Cherenksy, Comment, *A Penny for Their Thoughts: Employee-Inventors, Preinvention Assignment Agreements, Property, and Personhood*, 81 CALIF. L. REV. 595, 623 (1993). It is worth noting that the American system of uncompensated contractual cognitive assignment is an exception among highly innovative countries. In the United States, private employers have no affirmative duty to compensate employees for profits derived from their inventions. Lobel, *supra* note 147. By contrast, other countries with high patent competitiveness legally require businesses to pay fair compensation to the inventor who assigns an invention to them. Germany, the United Kingdom, France, and Finland all require fair compensation to the employee for any assigned invention. Morag Peberdy & Alain Strowel, *Employee’s Rights to Compensation for Inventions – A European Perspective*, in PLC CROSS-BORDER LIFE SCIENCES HANDBOOK 63, 63 (2009–2010). China and Japan similarly guarantee employee-inventors a reward for assigned work. Vai Io Lo, *Employee Inventions and Works for Hire in Japan: A Comparative Study Against the U.S., Chinese, and German Systems*, 16 TEMP. INT’L & COMP. L.J. 279, 306 (2002).

149. Jim C. Lai, *Alcatel USA, Inc. v. Brown: Does Your Boss Own Your Brain?*, 21 J. MARSHALL J. COMPUTER & INFO. L. 295, 298 (2003).

150. *Id.*

before joining Mattel.¹⁵¹ Indeed, during the trial, his attorneys presented substantial amounts of his early drawings from his high school and college years, including submissions to art competitions in his teens.¹⁵² In another recent case, an employee of Marathon Oil, Yale Preston, signed an assignment agreement that provided for the assignment of inventions “made or conceived” during employment.¹⁵³ Preston claimed he came up with the idea for his invention before his employment began, but the Federal Circuit held that regardless of when it was “conceived,” the invention had been first “made,” that is developed, during his employment and thus should belong to the company.¹⁵⁴ Moreover, the court found that Preston’s belief that his invention rights were protected because he had conceived of the invention before signing the contract was irrelevant.¹⁵⁵

The temporal reach of corporate ownership does not only occur by individual contract but also through institutional policy, such as a company handbook or an employee manual. Petr Táborský was an undergraduate science student at the University of South Florida when he discovered a method to turn cat litter into a reusable human-waste cleaning device.¹⁵⁶ Táborský’s project was funded by a grant from a Florida utility company.¹⁵⁷ After the initially scheduled end of the project passed, Táborský received permission to continue the research as part of his master’s thesis.¹⁵⁸ Táborský had not signed any employment agreement with neither the university nor the utility company, and yet both claimed ownership over the invention, based on the university policy assigning inventions from its employee to the university.¹⁵⁹

Táborský, convinced the discovery was his own, filed for a patent.¹⁶⁰ He also kept his handwritten lab notebooks, which became the center of the lawsuit, eventually leading to Táborský’s imprisonment.¹⁶¹ After a court determined that the university owned Táborský’s research, the notebooks were also deemed the property of the University of South Florida.¹⁶² Therefore, Táborský was charged for their theft (self-theft perhaps would be the correct term).¹⁶³

151. See Transcript of Record at 2846–48, *Bryant v. Mattel Inc.*, No. CV04-9049 (C.D. Cal. Dec. 3, 2008) (No. 4371-22) (testifying that Bryant drew award-winning female fashion designs since he was twelve years old).

152. *Id.*

153. *Preston v. Marathon Oil Co.*, 684 F.3d 1276, 1279 (Fed. Cir. 2012).

154. *Id.* at 1282, 1287–88.

155. *Id.* at 1287–88.

156. This example is adapted from LOBEL, *supra* note 19, at 152–53.

157. *Id.*

158. *Id.*

159. *Id.*

160. *Id.*

161. *Id.*

162. *Id.*

163. *Id.*

Táborský's refusal to comply with the order to transfer ownership of his patent and hand over his notebooks resulted in his imprisonment in a maximum-security state prison.¹⁶⁴ Táborský declined clemency offered by then-Florida Governor Lawton Chiles, explaining: "When you think about going to jail, it's so terrifying I couldn't get out of bed in the morning. But at some point I made the decision I wasn't going to let them use the criminal court to get something they weren't entitled to."¹⁶⁵

The 2011 Supreme Court case *Stanford v. Roche*¹⁶⁶ further solidified the contemporary realities of future-innovation assignment agreements, which preemptively strip away all rights and claims in one's innovation. In this case, two institutions, Stanford University and the biotech corporation Cetus, disputed over the ownership of a patent.¹⁶⁷ The dispute arose from the wording of two competing agreements that scientist Mark Holodniy had signed, each assigning future innovation.¹⁶⁸ In the backdrop of the new cognitive property, it should not be surprising that the dispute over invention ownership in this case was between two institutions, Cetus and Stanford, while the inventor had long been stripped of any claims to his invention.¹⁶⁹ The key issue in the case was the interpretation of the phrase "do hereby assign," which is commonly used in employment pre-invention assignment agreements.¹⁷⁰ The Supreme Court affirmed the Court of Appeals's construction of the phrase "do hereby assign" for future patent rights used by Cetus as taking effect immediately, thereby trumping Stanford's "I agree to assign" clause, which the Court interpreted as a promise of future action.¹⁷¹

The "automatic assignment" adopted by the Supreme Court has meant that an employment or assignment agreement signed at the beginning of employment automatically transfers title to the employer, with no further act of transfer required once those inventions are conceived and come into existence. These agreements often lead to the transfer of title of inventions conceived or created years after the inventor started work with the company.¹⁷² The automatic assignment rule runs contrary to long-understood

164. *Id.*

165. *Id.* at 152–53.

166. *Bd. of Trs. of the Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc.*, 131 S. Ct. 2188 (2011).

167. *Id.* at 2189.

168. *Id.*

169. *Id.* at 2192.

170. *See Bd. of Trs. of the Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc.*, 583 F.3d 832, 842 (Fed. Cir. 2009) (holding that due to the language in the contracts, Cetus' rights in the invention vested first); *Stanford*, 131 S. Ct. at 2199 (affirming the judgment of the Federal Circuit).

171. *Stanford*, 131 S. Ct. at 2199; *see also id.* at 2202–03 (Breyer, J., dissenting) (decrying that such a great distinction should be drawn between the phrases "do hereby assign" and "agree to assign").

172. *See, e.g., DDB Techs., L.L.C. v. MLB Advanced Media, L.P.*, 517 F.3d 1284, 1286–90 (Fed. Cir. 2008) (holding an automatic assignment agreement signed in 1980 to be enforceable against an inventor who developed his patented works through the 1990s).

maxims of equity, which have held that assignment of future, not-yet-in-existence goods creates a contractual right, not the actual assignment itself. Thus, until the property comes into existence, the assignee:

[H]as nothing but the contingency, which is a very different thing from the right immediately to recover and enjoy the property. . . . It is not an interest in property, but a mere right under the contract. . . . [F]or in [the] contemplation of equity it amounts not to an assignment of a present interest, but only to a contract to assign when the interest becomes vested.¹⁷³

Similarly in tension with the current interpretation of pre-invention assignment agreements, the Uniform Commercial Code states: “Goods must be both existing and identified before any interest in them can pass. Goods which are not both existing and identified are ‘future’ goods. A purported present sale of future goods or of any interest therein operates as a contract to sell.”¹⁷⁴ The difference between a contractual right of assignment and an automatic assignment rule is significant. Corporations have quickly taken note of this contractual difference between “agree to assign” and “hereby assign” and employ the latter in their standard employment contracts. Google’s employment contract, for example, provides further emphasis on the reach into the future as it states: “I hereby irrevocably assign to Google Inc. my rights in all Assigned Inventions, and convey to Google Inc. ownership of any Assigned Inventions not yet in existence.”¹⁷⁵

In a series of recent cases, the rule has meant stripping away an employee’s ability to contest the validity of the assignment agreement as well as fraudulent actions by their employers. Imagine an employee who pre-assigns all his future innovation and later discovers that his employer had falsely omitted him from several patent applications and obtained patents without naming the employee as a co-inventor.¹⁷⁶ Employee-inventors are now held to not have intervening equities that could defeat a pre-assignment contract.

In a current case on appeal before the Federal Circuit,¹⁷⁷ inventor Dr. Alex Shukh discovered that he was wrongly omitted from several patents filed by his employer.¹⁷⁸ Shukh was a star inventor for Seagate, with nine of

173. JOSEPH STORY, COMMENTARIES ON EQUITY JURISPRUDENCE 353 (Melville M. Bigelow ed., Boston, Little, Brown & Co. 13th ed. 1886) (footnotes omitted).

174. U.C.C. § 2-105(2) (2011).

175. Google Employment Contract, *supra* note 76.

176. Such an omission is in violation of the Patent Act. *See* 35 U.S.C. § 111(a)(1) (2012) (requiring a patent to be filed by the inventor or a person the inventor authorizes); *id.* § 115(a) (requiring the inventor to be named on the patent application); *id.* § 116(a) (requiring multiple people who make an invention together to apply for the patent jointly).

177. Notice of Docketing at 1, *Shukh v. Seagate Tech., LLC*, No. 14-1406 (Fed. Cir. Apr. 10, 2014).

178. *Shukh v. Seagate Tech., LLC*, No. 10-404, 2014 WL 1281518, at *14 (D. Minn. Mar. 31, 2014).

his inventions incorporated into several Seagate product lines of hard-disk drives.¹⁷⁹ While Shukh was named as an inventor for several of his inventions early in his employment, later on when his work relationship with his supervisors became strained, Shukh discovered that Seagate applied for other patents on inventions he co-invented without disclosing his co-inventorship.¹⁸⁰ Shukh demonstrated that he was given inventorship awards for inventions that Seagate had patent applications on, but he was falsely told these inventions would not be pursued for patenting.¹⁸¹ Automatic assignment construction divests inventors not only of ownership rights but also inventorship rights. The court ruled that because of the assignment agreement, the employee did not have standing to seek correction of the patents nor did he have a reputational interest.¹⁸²

Courts have further interpreted the automatic assignment rule to divest an employee–inventor of standing to seek correction of inventorship under the Patent Act. In several recent cases, the Federal Circuit held that an inventor who has assigned his or her inventions to an employer does not have standing to sue for the correction of inventorship because the inventor no longer has a stake in the invention.¹⁸³ In other words, the construction of “hereby assign” does not only propertize in advance all inventions that will be correctly filed by the employer but also has the effect of preventing an employee–inventor from later correcting inventorship or claiming breach of the assignment contract when an employer wrongly omits the inventor from patent applications. Such a construction leaves employees without recourse when stripped not only from ownership but also attribution for their inventions.

2. *After: Trailer Clauses and the Assignor Estoppel Doctrine.*—An invention-assignment trailer clause is designed to ensure a company’s right to future inventions even after the departure of the employee. A typical trailer clause states that after the employee leaves her job, her former employer owns any patent filed within a specified period.¹⁸⁴ While some states restrict

179. *Shukh v. Seagate Tech., LLC*, No. 10-404, 2011 WL 1258510, at *1 (D. Minn. Mar. 30, 2011).

180. *Id.* at *2–4, *14.

181. *Id.* at *3.

182. *Id.* at *6. *But see* *Chou v. Univ. of Chi.*, 254 F.3d 1347, 1353, 1356–57, 1359 (Fed. Cir. 2001) (holding that an inventor who assigned all inventions to her university nonetheless has standing because being named inventor entitled her to monetary rewards).

183. *See, e.g.,* *Larson v. Correct Craft, Inc.*, 569 F.3d 1319, 1327 (Fed. Cir. 2009) (holding that an inventor who has no financial interest in being named on a patent has no standing to sue for correction of inventorship); *Jim Arnold Corp. v. Hydrotech Sys., Inc.*, 109 F.3d 1567, 1571–72, 1579 (Fed. Cir. 1997) (holding that federal courts did not have removal jurisdiction over this patent infringement claim because the validity of a series of assignment contracts must be determined under state law before any federal question becomes at issue).

184. *See* *Ingersoll-Rand Co. v. Ciavatta*, 542 A.2d 879, 887 (N.J. 1988) (characterizing a trailer clause as one that “involves the assignment of future or post-employment inventions”).

the ability of employers to require such assignments postemployment, most courts routinely enforce these clauses, except in extreme circumstances in which the trailer clause is unlimited in its time or scope. For example, a trailer clause that is set for an indefinite period of time into the postemployment future, assigning all invention made by the former employees for which the firm might have an interest, is likely to be deemed unreasonable and void.¹⁸⁵ The typical trailer clause, limited in time (for example, one year postemployment) and in scope (for example, limiting the ownership over future innovation to inventions that relate to the former employer's business) is regularly upheld.¹⁸⁶

Like other cognitive controls, the benefits, legitimacy, enforceability, and scope of trailer clauses are questionable. Similar to other forms of cognitive controls, firms seek "to obtain more protection than the common law affords" by using trailer clauses.¹⁸⁷ The result is a penalty on former employees and their new employers if they wish to compete with their former firm. As such, they should be viewed as a postemployment restriction much like an absolute noncompete clause. As Robert Merges has described, trailer clauses "are best seen as particular applications of post-employment covenants not to compete, which have long represented a suspect class of obligations and are often voided under common-law restraint of trade principles."¹⁸⁸ Once again, the bargain reached in intellectual property is subverted by contractual arrangements purposely designed to give the firm ownership over innovation that would, by default, belong to its former employees.¹⁸⁹

In a recent case, a research scientist at Milliken resigned and started a new company.¹⁹⁰ While working for Milliken, the scientist developed an idea for a new type of fiber.¹⁹¹ In the months following his resignation, he continued to contemplate his idea, which led to his invention of a new

185. For example, in *Federal Screw Works v. Interface Systems, Inc.* the court held that a trailer clause for an indefinite period of time requiring former employees to turn over all inventions covering subjects both within the company's field of activity or "contemplated field of activity" was too restrictive and overbroad. 569 F. Supp. 1562, 1563–64 (E.D. Mich. 1983). The court held that "[i]t is not reasonable to confiscate all new inventions made by the employees for which Interface might have an interest." *Id.* at 1564.

186. Marc B. Hershovitz, *Unhitching the Trailer Clause: The Rights of Inventive Employees and Their Employers*, 3 J. INTELL. PROP. L. 187, 199–201 (1995).

187. *Id.* at 197.

188. Robert P. Merges, *The Law and Economics of Employee Inventions*, 13 HARV. J.L. & TECH. 1, 53 (1999).

189. See Michael R. Mattioli, Comment, *The Impact of Open Source on Pre-Invention Assignment Contracts*, 9 U. PA. J. LAB. & EMP. L. 207, 233–34 (2006) ("Unfortunately, pre-invention assignment agreements rendered these equitable solutions largely meaningless. And, rather than grappling with the troublesome implications of these forced agreements, courts of the early twentieth century generally followed a plain and simple path of enforcement.").

190. *Milliken & Co. v. Morin*, 731 S.E.2d 288, 291 (S.C. 2012).

191. *Id.*

fiber.¹⁹² Milliken alleged it owned the rights to the new fiber.¹⁹³ The scientist had signed an assignment agreement when he began his employment at Milliken stating that any inventions by the scientist, patentable or not, relating to Milliken's business or research or resulting from work he performed for the company during his employment were the property of Milliken.¹⁹⁴ The assignment clause had a holdover provision stating that such inventions developed within one year after termination of employment also belonged to Milliken.¹⁹⁵ The scientist argued that these covenants were invalid because they were legally equivalent to noncompete agreements and created an unlawful restraint on trade.¹⁹⁶ The South Carolina Supreme Court affirmed a jury verdict for Milliken,¹⁹⁷ ruling that holdover invention-assignment agreements "do not operate in restraint of the employee's trade but merely vest ownership of an invention with the entity which ought to have it."¹⁹⁸ While the court nodded to the idea that holdover clauses should be examined to ensure that they do not "curtail[] the employee's ability to earn a living,"¹⁹⁹ the court held that the one-year holdover was "eminently reasonable" because the invention was related to his former employer's business.²⁰⁰ Yet, while a trailer clause does not prohibit an inventive employee from working for a competitor in absolute language:

[B]usiness competitors do not desire to hire individuals obligated under such a clause because the work product of such employees may not accrue to the new employer's benefit. At best, employers that hire inventive employees obligated under such agreements will underutilize the employees' inventive skills so as not to develop conflicts with prior trailer clauses.²⁰¹

Operating similarly to a trailer clause, the assignor estoppel doctrine, a recently developed doctrine in patent law, constitutes a postemployment restriction over the cognitive abilities of employees. The assignor estoppel doctrine is a rule of equity that prevents the assignor of a patent from raising the defense of invalidity in case of a suit of patent infringement.²⁰² The doctrine of assignor estoppel was originally developed by courts to prevent unfairness in circumstances in which an owner of a patent right sells the right

192. *See id.* (stating that the scientist filed for a patent several months after resigning from Milliken).

193. *Id.*

194. *Id.* at 290.

195. *Id.*

196. Brief of Petitioner at 5, *Milliken*, 731 S.E.2d 288 (No. 2005-CP-23-7135).

197. *Milliken*, 731 S.E.2d at 290.

198. *Id.* at 292.

199. *Id.* at 293.

200. *Id.* at 295.

201. Hershovitz, *supra* note 186, at 198–99 (footnote omitted).

202. *See* Franklin D. Ubell, *Assignor Estoppel: A Wrong Turn from Lear*, 71 J. PAT. & TRADEMARK OFF. SOC'Y 26, 26 (1989) (describing a Federal Circuit holding that estopped an inventor from denying the validity of a patent he had assigned).

to her patent and later denies the value of the very thing from which she profited.²⁰³ The logic is analogous to landlord–tenant situations and estoppel by deed of real estate.²⁰⁴ The courts viewed an “intrinsic unfairness in allowing an assignor to challenge the validity of the patent it assigned” because of “the implicit representation of validity contained in an assignment of a patent for value.”²⁰⁵ This logic however is flipped on its head when we shift our inquiry from patent law to human capital law and examine the application of the doctrine in the context of pre-invention assignment in the employment relationship. As we saw, assignment clauses refer to future innovation rather than a patent in suit. The invention can be very different than what had been assigned. Indeed, the USPTO often determines that a filed patent application must be divided into two or more patents, expanded, or modified.²⁰⁶ Thus, assignment of future innovation is always done under conditions of uncertainty.²⁰⁷ Put differently, in the context of human capital, the representation of the assignment in contracts assigning future innovation is made by the employer rather than the employee. Thus, the landlord parallels the employer and the tenant parallels the employee. The analogies that served as the basis for the development of the assignor estoppel doctrine do not simply fail but are reversed.

In practice, the assignor estoppel doctrine operates to place a former employee and his new employer at a great disadvantage compared to all other competitors because their legal defenses are dramatically diminished. Because invalidity is a major defense in patent litigation,²⁰⁸ in essence, assignor estoppel penalizes a former employee and thus creates a powerful disincentive for competitors to hire an employee who has experience in the field. Essentially, anyone who already has human capital in the hiring company’s field becomes a liability for the new company. The following has become a prevalent scenario: an employee, as part of his employment

203. See *Kinsman v. Parkhurst*, 59 U.S. (18 How.) 289, 293 (1855) (estopping an assignor from asserting the invalidity of a patent when he had received money for the patented invention by force of contract); Amber L. Hatfield, Note, *Life After Death for Assignor Estoppel: Per Se Application to Protect Incentives to Innovate*, 68 TEXAS L. REV. 251, 260 & n.61 (1989) (describing *Kinsman* as one of the earliest American assignor estoppel cases).

204. See *Pandrol USA, LP v. Airboss Ry. Prods., Inc.*, 424 F.3d 1161, 1166–67 (Fed. Cir. 2005) (noting that courts have applied both of these analogies).

205. *Mentor Graphics Corp. v. Quickturn Design Sys., Inc.*, 150 F.3d 1374, 1378 (Fed. Cir. 1998).

206. See *Westinghouse Elec. & Mtg. Co. v. Formica Insulation Co.*, 266 U.S. 342, 353 (1924) (noting that patent “claims are subject to change by curtailment or enlargement by the Patent Office with the acquiescence or at the instance of the [inventor]”); U.S. PATENT & TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE 700-162 (9th ed. 2014) (providing that the USPTO may contact a patent applicant to request amendments or other submissions to address patentability issues).

207. See *Q.G. Prods., Inc. v. Shorty, Inc.*, 992 F.2d 1211, 1213 (Fed. Cir. 1993) (noting that when the bounds of future patent claims are uncertain, the U.S. Supreme Court has recognized the need for “ample evidence to define the assignor’s representations”).

208. 35 U.S.C. § 282(b)(2)–(3) (2012). See generally *Microsoft Corp. v. i4i Ltd. P’ship*, 131 S. Ct. 2238 (2011) (discussing the invalidity defense).

agreement, assigns an invention to the firm (Firm A). The employee moves to a competing firm, Firm B. After the employee leaves Firm A, Firm A files for a patent on the former employee's inventions. This can happen without the employee's knowledge or consent regarding the claims issued and the scope of the filed patents. Frequently, claims are filed postemployment and without the former employee's control over the filed claims. During this period after the employee began working at Firm B, she works on innovation for Firm B. If Firm A sues Firm B for patent infringement, Firm B is estopped from attacking the validity of the patent because it has hired a former Firm A employee and involved the employee in the innovation in question.²⁰⁹

The perverse result is that the most productive and experienced employees, who are already engaged in inventive activities in their industry, become untouchables.²¹⁰ The hiring of these employees who are already in the field creates an immense risk. Aberrantly, the more experienced an employee, the less employable they become. The assignment agreement coupled with the assignor estoppel doctrine becomes a de facto trailer clause, both tantamount to a postemployment noncompete.

3. *And Everything in Between: Weekends and Nights.*—In *Mattel v. MGA*²¹¹ much of the trial drama centered on whether the court could pinpoint the moment that Carter Bryant created his brainchild, the Bratz doll. Recall that Bryant's employment agreement provided assignment for all inventions conceived or reduced to practice "at any time during [his] employment" at Mattel.²¹² Bryant argued that he came up with the concept of the doll while on a year leave from Mattel in 1998.²¹³ Alternatively, he argued that even if

209. See *Juniper Networks, Inc. v. Palo Alto Networks, Inc.*, No. 11-1258-SLR, 2014 WL 527621, at *1–2 (D. Del. Feb. 6, 2014) (involving almost the same situation as the hypothetical). In *Juniper*, the employee was one of the founders of the new company. *Id.* Similarly, assignor estoppel has been invoked against the hiring firm even when the new employee is not a founder but heavily involved in the allegedly infringing operations. In other situations, the former employee is estopped but not the hiring corporation as a whole. See 6A DONALD S. CHISUM, CHISUM ON PATENTS, § 19.02[3][b][iii] & n.49, at 19-146.15 (2014).

210. There may well be gender and age impact. Women are still more likely than men to be geographically constrained by dual-career coordination. See Anne Green et al., *The Employment Consequences of Migration: Gender Differentials*, in *MIGRATION AND GENDER IN THE DEVELOPED WORLD* 60, 63–64 (Paul Boyle & Keith Halfacree eds., 2005) (noting a study in which nineteen of thirty dual-career households reported that the male's career took precedent in migration decisions). Restrictions over their job mobility may create a disincentive to move jobs altogether. Similarly, older employees are likely to have more job experience, which perversely under the new cognitive property creates a further penalty on their employment, in a labor market that is already prone to age discrimination. See Noam Scheiber, *The Brutal Ageism of Tech*, NEW REPUBLIC, Mar. 23, 2014, <http://www.newrepublic.com/article/117088/silicons-valleys-brutal-ageism>, archived at <http://perma.cc/2RZH-TUNW> (examining the taboo of age in the tech world).

211. *Mattel, Inc. v. MGA Entm't, Inc.*, 616 F.3d 904 (9th Cir. 2010).

212. *Id.* at 909.

213. Edvard Pettersson, *MGA Wins \$225 Million Punitive Damages, Fees Against Mattel*, BLOOMBERG (Aug. 5, 2011, 9:49 AM), <http://www.bloomberg.com/news/2011-08-04/mattel-must->

he had worked on the concept during the period in which he was employed, he did this during his off time—at home at night and on weekends.²¹⁴ The question then becomes, even if one assigns his rights for all innovation while employed, can assignment include all cognitive resources twenty-four hours a day and seven days a week?

In looking at the issue, once again Judge Kozinski construed the issue as a question of contractual interpretation. Mattel argued that the contract must expand the contours of IP, which merely assigns to the employer work made for hire; otherwise, according to Mattel's logic, there would not be a need for a human capital contract.²¹⁵ Judge Kozinski rejected Mattel's simplified version of IP-contract nexus:

Mattel argues that because employers are already considered the authors of works made for hire under the Copyright Act, 17 U.S.C. § 201(b), the agreement must cover works made outside the scope of employment. Otherwise, employees would be assigning to Mattel works the company already owns. But the contract provides Mattel additional rights by covering more than just copyrightable works.²¹⁶

In other words, the mere existence of an assignment agreement is not enough to expand the legal contours of IP ownership. At the same time, Judge Kozinski took no issue with expansion by contract as long as it is clearly drafted with specific language.²¹⁷ Judge Kozinski thereby remanded the case so the lower court could examine the ambiguous contract by looking at past practices and industry norms.²¹⁸ Judge Kozinski accepted the expansion of innovation ownership by contract beyond what IP doctrine provides but urged the use of direct language, thereby setting a corporate learning curve for effectively erecting cognitive fences.

While some states delineate some limits on assignment contracts, most states allow for an expanding requirement to relinquish all rights of invention during the term of employment.²¹⁹ Even those states that limit certain types of assignment in practice provide a very narrow restriction on assignment. California, one of the states that delimits the scope of pre-invention

pay-mga-225-million-in-punitive-damages-fees-in-bratz-case.html, archived at <http://perma.cc/EBD4-WX28>.

214. See *Mattel*, 616 F.3d at 912 (discussing the district court's rejection of this argument).

215. *Id.* at 912 n.7.

216. *Id.*

217. See *id.* at 913, 917 (holding that the language of the contract is too ambiguous to support summary judgment but allowing the jury to decide whether the contract "assigned works created outside the scope of Bryant's employment").

218. See *id.* at 912, 917 (remanding, in part, to resolve the ambiguity of the phrase "at any time during my employment"); *id.* at 913–17 (discussing extrinsic evidence that may show copyright infringement).

219. Donald J. Ying, Comment, *A Comparative Study of the Treatment of Employee Inventions, Pre-Invention Assignment Agreements, and Software Rights*, 10 U. PA. J. BUS. & EMP. L. 763, 766 (2008) (indicating that only eight states have passed legislation limiting pre-invention assignment agreements).

assignment,²²⁰ states in its Labor Code that an employment agreement requiring an employee to transfer her rights to an invention is not enforceable if the invention was developed entirely on her own time and without using employer resources or trade secrets, unless the invention was anticipated as part of the job for which she was hired.²²¹ In the context of Google for example, this narrow exception becomes particularly mute. As one recent Google hire described:

Google is gigantic and has teams working on virtually everything (including things they're not known for like games, education, flying magnets, etc.), even if these interests are a tiny fraction of the company. Thus it seems they could claim just about anything.²²²

In the contemporary knowledge economy, almost any innovation can be construed as related to the firm, thereby rendering most exceptions irrelevant. Relatedly, in today's patterns of work, in which employees are expected to be connected to the workplace around the clock through remote electronic devices, work time appears to be timeless and without boundaries. Thus, even in the absence of an invention assignment contract, courts have broadly interpreted the doctrine of hired-to-invent to include work done at home. For example, the employer can own original sketches of an invention made by an employee at his home because the company had tasked him with inventing the process at issue.²²³ To be on the safe side, companies explicitly draft the assignment contract to include work done during off hours. Google, for example, explicitly encompasses weekends and nights into its standard assignment agreement: "Google Inc. will own all Inventions that I invented, developed, reduced to practice, or otherwise contributed to, solely or jointly with others, during my employment with Google (*including during my off-duty hours*)."²²⁴

220. *Id.*

221. CAL. LAB. CODE § 2870 (West 2011 & Supp. 2015); *see also* Cadence Design Sys., Inc. v. Bhandari, No. C 07-00823, 2007 WL 3343085, at *6-7 (N.D. Cal. Nov. 8, 2007) (holding that under § 2870 inventions that "relate to employer's business" include any inventions within the general scope of the employer's business); Cubic Corp. v. Marty, 229 Cal. Rptr. 828, 835 (Cal. Ct. App. 1986) (explaining that § 2870 does not apply if the invention grew out of the employer's research and development or resulted from work performed for the employer).

222. E-mail from Camilla Alexandra Hrdy, Postdoctoral Fellow, Yale Law Sch., to author (Apr. 19, 2014, 11:49 PST) (on file with author).

223. Teets v. Chromalloy Gas Turbine Corp., 83 F.3d 403, 406, 408 (Fed. Cir. 1996).

224. Google Employment Contract, *supra* note 76 (emphasis added). Ironically, the expansion of time exists in tension with the efforts made to draw the lines between work hour and off time. Employment laws militantly police the lines between on-the-job and off-the-job hours for the purposes of wage and hour. In this past term, the Supreme Court spent hours deciding a case concerning whether donning and doffing protective work gear is time worked or arrival time to the workplace that is not compensable. *See* Sandifer v. U.S. Steel Corp., 134 S. Ct. 870, 879 (2014) (holding that time spent donning and doffing protective gear was time spent "changing clothes" under the Fair Labor Standards Act and was therefore not compensable). And yet, with regard to fruits of an employee's labor, courts have increasingly rejected the distinction between on-the-job and off-the-job efforts. *See* Nachtigal, *supra* note 42 (noting that in *Brown v. Alcatel USA, Inc.*,

Traditionally, IP law attempted to incentivize employee invention by striking the balance of granting the employee's ownership over most innovation and providing the employer a partial stake in the invention, termed "shop right." The shop right is an implied license granted by the inventor to her employer to use an invention created outside the scope of the employee's duties when the invention is related to the company and the work environment contributed to its creation.²²⁵ Today, this doctrine is becoming obsolete because the expansion by contract of corporate ownership has tipped the balance to include innovation far beyond work-for-hire and hire-to-invent. In the contemporary labor market, even in the absence of a signed contract, some courts allow pre-innovation assignments via oral or implied agreements.²²⁶

D. The Partiality–Totality Spectrum: Noncompetes and Noncompetes on Steroids

1. The Rise of the Postemployment Covenant Thicket.—The signing of a noncompete contract has become a standard requirement in our contemporary labor market. Employees routinely sign noncompetes promising to not work in their profession in the same region for a period of time. The vast majority of senior executives are bound by noncompete clauses.²²⁷ At the same time, noncompetes are also on a sharp rise for all nonmanagerial employees.²²⁸ Workers ranging from event planners to chefs, from investment-fund managers to yoga instructors, from physicians to camp counselors are all increasingly required to sign them.²²⁹ The number of lawsuits involving noncompetes has almost doubled in the past decade.²³⁰ Attorneys describe noncompetes as "the most powerful weapon for

Brown's work on the "Solution," which the court awarded to Brown's employer, pre-dated his employment and was even finished while Brown was on vacation).

225. *United States v. Dubilier Condenser Corp.*, 289 U.S. 178, 188 (1933).

226. *See Larson v. Correct Craft, Inc.*, 537 F. Supp. 2d 1264, 1268 (M.D. Fla. 2008) (holding that employer and employee entered into an implied-in-fact contract to assign patent rights); *Dickman v. Vollmer*, 736 N.W.2d 202, 208 (Wis. Ct. App. 2007) (holding that agreements to assign do not need to be in writing; upon sufficient proof, oral pre-assignments may be upheld).

227. Noncompetes exist in almost 80% of chief executive contracts, Norman D. Bishara et al., *When Do CEOs Have Covenants Not to Compete in Their Employment Contracts?*, 34 & tbl.2 (Vanderbilt Univ. Law Sch. Law & Econ., Working Paper No. 12-33, 2013), available at <http://ssrn.com/abstract=2166020>, archived at <http://perma.cc/H4ZB-36HG>, and over 70% of senior executive contracts, Mark J. Garmaise, *Ties that Truly Bind: Noncompetition Agreements, Executive Compensation, and Firm Investment*, 27 J.L. ECON. & ORG. 376, 378 (2009).

228. *See Matt Marx, The Firm Strikes Back: Non-Compete Agreements and the Mobility of Technical Professionals*, 76 AM. SOC. REV. 695, 696 (2011) (recording that almost half of technical employees report being asked to sign a noncompete agreement).

229. Greenhouse, *supra* note 2.

230. Russell Beck, *Trade Secret and Noncompete Survey – National Case Graph 2014 [Preliminary Data]*, FAIR COMPETITION L. (Jan. 7, 2014), <http://faircompetitionlaw.com/2014/01/07/trade-secret-and-noncompete-survey-national-case-graph-2014-preliminary-data/>, archived at <http://perma.cc/RF6C-U7D2>.

employers.”²³¹ And yet, “the legal disputes only show the tip of the iceberg” because the large majority of employees do not choose to challenge the validity of these contracts.²³²

In debates about patent law reform, the patent thicket connotes a dense web of IP protections that in aggregate obstructs entry to markets and thus impedes innovation.²³³ In other words, the sheer quantity of the restrictions qualitatively changes the nature of competition.²³⁴ It creates a thick cluster of property rights that rigidifies the market and reduces the ability to move forward. Noncompetes are not only pervasive but also broad and often amorphous. Noncompete contracts are often drafted in an attempt to prevent all possible forms of competition, or indeed departure, of employees. A recent example involving a sales representative who signed a noncompete that prohibited the former employee from working for a competitor in any capacity is illustrative.²³⁵ A North Carolina court of appeals deemed the contract overly broad and thereby unreasonable and unenforceable.²³⁶ Most states employ such an ad hoc standard of reasonableness to test the validity of a noncompete.²³⁷ Current policies delineating the enforceability of these controls are largely case by case and unpredictable. As one court described this unpredictability:

No layman could realize the legal complication involved in [the] uncomplicated act [of signing a noncompete]. This is not one of those questions on which the legal researcher cannot find enough to quench his thirst. To the contrary there is so much authority it drowns him. It is a sea—vast and vacillating, overlapping and bewildering. One can fish out of it any kind of strange support for anything, if he lives so long. This deep and unsettled sea pertaining to an employee’s covenant not to compete with his employer after termination of employment is really Seven Seas; and now that the court has sailed them, perhaps it should record those seas so that the next weary traveler may be saved the terrifying time it takes just to find them.²³⁸

231. Matthew Huddleston, *Foot Anstey: Non-Compete Clauses - The Most Powerful Weapon for Employers*, MONEY MARKETING (May 27, 2014, 8:00 AM), <http://www.moneymarketing.co.uk/news-and-analysis/regulation/foot-anstey-non-compete-clauses-the-most-powerful-weapon-for-employers/2010323.article>, archived at <http://perma.cc/M4K3-UHSP>.

232. Orly Lobel, *By Suppressing Mobility, Noncompete Pacts Suppress Innovation*, ROOM FOR DEBATE, N.Y. TIMES (June 11, 2014, 4:46 PM), <http://www.nytimes.com/roomfordebate/2014/06/10/should-companies-be-allowed-to-make-workers-sign-noncompete-agreements/by-suppressing-mobility-noncompete-deals-suppresses-innovation>, archived at <http://perma.cc/9AQ4-BERA>.

233. INTELLECTUAL PROP. OFFICE, A STUDY OF PATENT THICKETS 7 (2013).

234. See Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, 1 INNOVATION POL’Y & ECON. 119, 119–22 (2001) (discussing the patent thicket and its effect on the commercialization of new technology).

235. *CopyPro, Inc. v. Musgrove*, 754 S.E.2d 188, 192–93 (N.C. Ct. App. 2014).

236. *Id.* at 195.

237. Lobel, *supra* note 95, at 519.

238. *Arthur Murray Dance Studios of Cleveland, Inc. v. Witter*, 105 N.E.2d 685, 687 (Ohio Ct. C.P. 1952).

The reasonableness standard is an open-ended legal term, consisting of a balancing test applied by the courts weighing “legitimate business interests,” “employee hardships,” and the “public interest.”²³⁹ The balancing is generally conducted on a case-by-case basis, without either referencing contemporary data or generalizing beyond the particular facts of each dispute.²⁴⁰ The court’s reasoning in these cases is often conclusory and subjective.²⁴¹

In practice, most employees will alter their careers and decision making to avoid risk rather than challenge unreasonable noncompetes in court. One study that examined the behavioral patterns of inventors bound by postemployment restrictions found that these inventors are likely to engage in survival tactics—such as taking unpaid sabbaticals and unemployment, leaving their profession, or severing their past professional connections—in the hope that they will fly under their former employer’s radar should they continue to work in their chosen career path.²⁴² Another study, which looked at the emigration of inventors, found that inventors leave states that enforce noncompete agreements in far higher rates than they leave states that do not.²⁴³ The researchers conclude that noncompetes lead to a “brain drain” of the most valuable knowledge workers.²⁴⁴ They warn that the evidence suggests noncompetes drive away those with the strongest human capital, a phenomenon which over time keeps the least desirable employees in regions that enforce noncompete restrictions while pushing the best employees to more open regions.²⁴⁵

From a firm perspective, many potential new employers will not risk a lawsuit by hiring an employee already bound by a noncompete. For example, in a recent case a former employer sent a competitor, who hired its departing employee, a letter about the existence of a noncompete.²⁴⁶ In a standard move, the employee was immediately fired from the new job.²⁴⁷ In this case, the employee filed a lawsuit against his former employer for tortious interference with his relationship with the new employer.²⁴⁸ The court

239. Lobel, *supra* note 95, at 519.

240. *Id.* at 519–20.

241. *See id.* at 520 (observing that case-by-case analysis of noncompete agreements by courts “does not easily lend itself to principled analysis”).

242. Marx, *supra* note 228, at 709; Matt Marx & Lee Fleming, *Non-Compete Agreements: Barriers to Entry . . . and Exit?*, 12 INNOVATION POL’Y & ECON. 39, 48–50 (2001).

243. Matt Marx et al., *Regional Disadvantage?: Employee Non-Compete Agreements and Brain Drain*, 44 RES. POL’Y 394, 395–96 (2015). Even when California and Connecticut are excluded from the analysis, the data shows a 25% higher emigration rate from high-enforcement states to weaker enforcing states. *Id.* at 401 tbl.5.

244. *Id.* at 399.

245. *Id.* at 403.

246. *Bonds v. Philips Elec. N. Am.*, No. 2:12-cv-10371, 2014 WL 222730, at *2 (E.D. Mich. Jan. 23, 2014).

247. *Id.* at *3.

248. *Id.* at *1.

dismissed the case, explaining that a former employer has a right to send such warning letters and that the result of the firing does not present a legal issue.²⁴⁹

Only a handful of states ban or nearly ban the enforcement of noncompete agreements, most notably California, which has banned noncompetes since the founding of the state. The California Business and Professions Code voids “every contract by which anyone is restrained from engaging in a lawful profession, trade, or business.”²⁵⁰ The courts have understood this exceptional California law, which runs contrary to most other states, as a policy of favoring open competition and promoting a citizen’s right to pursue the employment and enterprise of his or her choice.²⁵¹ Other states are following California’s lead; in April 2014, Massachusetts Governor Deval Patrick proposed banning noncompetes in the state, alluding to the new evidence demonstrating their detrimental effects.²⁵²

2. *Name Game: Nonsolicitation, Nondealing, and Nonpoaching.*—An effective noncompete contract does not need to be labeled or entitled as such. Restrictions over the use of human capital do not have to explicitly use the language of noncompetes to reach the result of restricting employee mobility postemployment. As discussed above with regard to trailer clauses, trade secrets, and the doctrine of assignor estoppel, imposing a postemployment penalty on a former employee is tantamount in its economic effect to noncompetes. Increasingly, a standard human capital clause is a nonsolicitation clause, an agreement in which an employee agrees not to solicit a company’s clients or customers, for her own benefit or for the benefit of a future employer after leaving the company.²⁵³ A nondealing clause is an even stronger prohibition as it precludes the employee from dealing with the former employer’s customers postemployment even if these customers approach the former employee without solicitation.²⁵⁴ A nonpoaching clause

249. *Id.* at *7–8.

250. CAL. BUS. & PROF. CODE § 16600 (West 2008).

251. *Beer & Wine Servs., Inc. v. Dumas*, No. B151792, 2003 WL 1194725, at *3 (Cal. Ct. App. Mar. 17, 2003).

252. Callum Borchers & Michael B. Farrell, *Patrick Looks to Eliminate Tech Noncompete Agreements*, BOSTON GLOBE, Apr. 10, 2014, <http://www.bostonglobe.com/business/2014/04/09/go-v-patrick-pushes-ban-noncompete-agreements-employment-contracts/kgOq3rkbTQkhYooVlicfOO/story.html>, archived at <http://perma.cc/AA6N-3VVM>.

253. David L. Johnson, *The Parameters of “Solicitation” in an Era of Non-Solicitation Covenants*, 28 ABA J. LAB. & EMP. L. 99, 99 (2012); see also DAVID J. CARR, THE PROTECTION OF TRADE SECRETS, CONFIDENTIAL INFORMATION AND GOODWILL: DRAFTING ENFORCEABLE CONFIDENTIALITY, NON-COMPETE AND NON-SOLICITATION AGREEMENTS: 10 TRICKS AND TRAPS 3 (2002), available at http://www.americanbar.org/content/dam/aba/events/labor_lab/basics_papers/tradesecrets/carr.authcheckdam.pdf, archived at <http://perma.cc/WP7W-YKAH> (listing nonsolicitation agreements alongside noncompete and trade secret agreements as contractual protections against industrial espionage).

254. See, e.g., *Curtis 1000, Inc. v. Martin*, 197 F. App’x 412, 423 (6th Cir. 2006) (enforcing a covenant prohibiting an individual from accepting unsolicited business from his former employer’s

prohibits the former employee from luring away any employees of the former employer. For example, Google's employment contract includes the following clause:

[D]uring my employment with Google and for twelve months immediately following its termination for any reason, whether voluntary or involuntary, with or without cause, I will not directly or indirectly solicit any of Google's employees to leave their employment.²⁵⁵

In some instances, courts even construe a nonsolicitation clause as a nondealing clause. In *Manuel Lujan Insurance, Inc. v. Jordan*,²⁵⁶ an insurance company employed the defendant as a manager in its bond department.²⁵⁷ Part of the employment agreement included a promise to "not for a period of two (2) years from the date of termination of employment solicit the customers (policyholders) of the Company, either directly or indirectly."²⁵⁸ The agreement further stated that "[t]he purpose of this paragraph is to insure that the Employee for the periods set out herein, will not in any manner directly or indirectly enter into competition with the Company on [sic] the customers of the Company as of date of termination."²⁵⁹ The trial court enjoined the former employee from soliciting or accepting business from the company's customers.²⁶⁰ Upon appeal, the Supreme Court of New Mexico explained:

[I]t is not clear whether the word "solicit" should be narrowly interpreted as precluding only solicitation but allowing [a former employee] to accept the unsolicited business of [the employer's] customers. On the other hand, inclusion of the non-competition provision in the second sentence may be viewed as including prohibitions against any acceptance of, or competition for, the customers²⁶¹

clients); *USI Ins. Servs. LLC v. Miner*, 801 F. Supp. 2d 175, 188 (S.D.N.Y. 2011) (same); *Pulse Techs., Inc. v. Dodrill*, No. CV-07-65-ST, 2007 WL 789434, at *12 (D. Or. Mar. 14, 2007) (same); *Ecolab, Inc. v. K.P. Laundry Mach., Inc.*, 656 F. Supp. 894, 896 (S.D.N.Y. 1987) (same); *Clark v. Liberty Nat'l Life Ins. Co.*, 592 So. 2d 564, 566 (Ala. 1992) (same); *Spitz, Sullivan, Wachtel & Falcetta v. Murphy*, No. CV-86-0322422, 1991 WL 112718, at *6 (Conn. Super. Ct. June 13, 1991) (upholding such a covenant while noting that "[t]he defendant has cited no Connecticut precedent which renders such an agreement unenforceable merely because it prohibits a defecting professional employee from servicing unsolicited clients of his former employer"); *Envtl. Servs., Inc. v. Carter*, 9 So. 3d 1258, 1266–67 (Fla. Dist. Ct. App. 2009) (holding a covenant banning former employees from performing services for the employer's costumers to be enforceable).

255. Google Employment Contract, *supra* note 76.

256. 673 P.2d 1306 (N.M. 1983).

257. *Id.* at 1307.

258. *Id.* at 1308.

259. *Id.*

260. *Id.*

261. *Id.* at 1309.

The court concluded that, looking at the totality of the wording in the contract and the surrounding evidence presented in court, it was “apparent that the parties intended that [the former employee] be restricted from competing by not soliciting or accepting business from [the employer’s] customers.”²⁶² The court thus held that the contract should be read as a comprehensive ban on acceptance, rather than merely a narrow promise not to solicit.²⁶³ Even in the absence of express nonsolicitation agreements, client lists are often considered trade secrets, at the very least if such lists contain information that is not easily ascertainable through publicly available lists, such as details about the clients’ past orders or any information that could undercut a competitor’s pricing beyond merely the names and contacts of clients.²⁶⁴

Nonpoaching and nonhiring clauses round out the list of untouchables—expanding ownership from clients to coworkers—by stripping former employees of their professional network. In some instances, like with nonsolicitation, courts have interpreted nonpoaching clauses as an absolute prohibition of hiring former coworkers. For example, in *International Security Management Group, Inc. v. Sawyer*,²⁶⁵ an employee signed a contract agreeing that he would not “solicit” any coworker to “terminate that person’s employment . . . and to accept employment with a [competitor].”²⁶⁶ The former employee was approached by former coworkers after he placed an ad in the local newspaper.²⁶⁷ A Tennessee federal district court held that “[t]he extension of a job offer alone would qualify as solicitation, as it constitutes an instance of requesting or seeking to obtain something.”²⁶⁸ At the same time, other courts have construed nonsolicitation clauses more narrowly, as only prohibiting active and specific inducement.²⁶⁹ To expand the reach of the prohibition more explicitly, nonhiring clauses encompass the

262. *Id.*

263. *Id.* at 1309–10.

264. See *Optos Inc. v. Topcon Med. Sys., Inc.*, 777 F. Supp. 2d 217, 238–39 (D. Mass. 2011) (declaring that the company’s customer list was likely a trade secret because of several factors, including that the list was “practically impossible” to compile using publicly available information); *Tom James Co. v. Hudgins*, 261 F. Supp. 2d 636, 641–42 (S.D. Miss. 2003) (finding that the company’s customer list falls within Mississippi’s definition of “trade secrets” because the company took reasonable efforts to maintain the list’s secrecy, and the list could not be easily duplicated by public directories); *Home Pride Foods, Inc. v. Johnson*, 634 N.W.2d 774, 781–82 (Neb. 2001) (finding that a customer list was a trade secret because the list contained information not ascertainable from publicly available lists, had independent economic value, and was kept secret).

265. No. 3:06CV0456, 2006 WL 1638537 (M.D. Tenn. June 6, 2006).

266. *Id.* at *3.

267. *Id.* at *17.

268. *Id.* (quoting BLACK’S LAW DICTIONARY 1427 (8th ed. 2004)) (internal quotation marks omitted).

269. See *Meyer–Chatfield v. Century Bus. Servicing, Inc.*, 732 F. Supp. 2d 514, 521–22 (E.D. Pa. 2010) (finding the word “solicit” to not include hiring); *Enhanced Network Solutions Grp., Inc. v. Hypersonic Techs. Corp.*, 951 N.E.2d 265, 268–69 (Ind. Ct. App. 2011) (holding that a subcontractor’s hiring of an employee does not violate a nonsolicitation agreement when that employee initiated contact with the subcontractor).

more passive instances in which a coworker approaches the former employee for a job.²⁷⁰ All of these clauses, targeting the connections formed between former employees and their professional networks, impose a competition penalty on former employees and function equivalently to noncompetes. Courts have largely accepted that using prior knowledge and experience in an attempt to compete over customers and market talent breaches upon corporate rights to cognitive property.

3. *Cognitive Cartels*.—Starting in 2005, top executives at Google, Apple, Adobe, Intel, Intuit, Pixar, Lucas Film, eBay, and other major high-tech companies reached gentlemen’s agreements to not hire each other’s employees. The no-hire agreements covered the entire workforce of each company and were not “limited by geography, job function, product group, or time period.”²⁷¹ In 2010, the Antitrust Division of the United States Department of Justice (DOJ) filed a complaint against these tech giants, deeming such do-not-hire agreements to be collusive restraints on trade and competition.²⁷² The breadth of the agreements led the DOJ to conclude that these agreements were per se violations of American antitrust law.²⁷³ The settlement reached between the DOJ and the high-tech companies “enjoins the nonsolicit agreements and, more broadly, prohibits agreements regarding solicitation and recruitment.”²⁷⁴ The Department of Justice stated:

These actions by the Antitrust Division remind us all that the antitrust laws guarantee the benefits of competition to all consumers, including working men and women. The agreements we challenged here not only harmed the overall competitive process but, importantly, harmed specialized and much sought after technology employees who were prevented from getting better jobs and higher salaries. Stifling opportunities for these talented and highly-skilled individuals was bad for them and bad for innovation in high-tech industries.²⁷⁵

In 2013, a United States district court certified a private class of 64,000 former employees of these high-tech giants who filed a class action, arguing

270. Still, some courts have found that nonhiring clauses are unenforceable, similarly to noncompetes. *E.g.*, *Cox v. Altus Healthcare & Hospice, Inc.*, 706 S.E.2d 660, 664 (Ga. Ct. App. 2011); *Cap Gemini Am., Inc. v. Judd*, 597 N.E.2d 1272, 1287 (Ind. Ct. App. 1992).

271. Complaint at 5, *United States v. Adobe Sys., Inc.*, No. 1:10-cv-01629, 2011 WL 10883994 (D.D.C. Sept. 24, 2010).

272. *Id.* at 2.

273. *Id.*

274. LOBEL, *supra* note 19, at 220; *see also* *United States v. Adobe Sys., Inc.*, No. 1:10-cv-01629, 2011 WL 10883994, at *2 (D.D.C. Mar. 18, 2011).

275. Press Release, Dep’t of Justice, Remarks as Prepared for Delivery by Assistant Attorney General Bill Baer at the Conference Call Regarding the Justice Department’s Settlement with eBay Inc. to End Anticompetitive “No Poach” Hiring Agreements (May 1, 2014), *available at* http://www.justice.gov/atr/public/press_releases/2014/305619.pdf, *archived at* <http://perma.cc/Q833-BFAW>.

that these anticompetitive practices depressed their wages in the industry.²⁷⁶ The high-tech talent cartel ran deeper and broader than this first unique class action reveals. There is evidence to suggest that other companies, including Comcast, Genentech, PayPal, Nvidia, Dell, Microsoft, DoubleClick EarthLink, AOL, Ask Jeeves, Clear Channel, Oracle, Lycos, Palm, Best Buy, Nike, and Foxconn may have been involved in these human capital collusions.²⁷⁷

Steve Jobs was the architect and driving force of these cognitive cartels. Jobs e-mailed Google warning: “If you hire a single one of these people that means war.”²⁷⁸ The secret agreement that followed was so strong that when a Google recruiter did contact Apple engineers, Jobs immediately reminded Google of his warning.²⁷⁹ Google fired the recruiter immediately.²⁸⁰ According to the allegations, Google even asked for Jobs’s permission to hire former Apple employees.²⁸¹ In addition, the do-not-hire agreements spun globally. For example, one e-mail reveals Google’s pacific leadership recruiter asking Google’s director of recruiting to confirm whether they could cold call companies in Korea “excluding the ‘do not cold call’ companies, of course.”²⁸² The collusive agreements included not only the engineers but also the chefs who worked in the company cafeteria.²⁸³ Recruiters received lists of companies off limits: “No one calls, networks, or e-mails into the company or its subsidiaries looking for people.”²⁸⁴ The record indicates that top executives at these Silicon Valley giants understood the possible illegality of these agreements.²⁸⁵ Eric E. Schmidt, Google’s CEO at the time, asked his people to not keep a paper trail about the agreements.²⁸⁶

276. Joel Rosenblatt & Karen Gullo, *Apple, Google Must Face Group Antitrust Hiring Lawsuit*, BLOOMBERG (Oct. 25, 2013, 6:13 PM), <http://www.bloomberg.com/news/2013-10-25/apple-google-must-face-group-antitrust-hiring-lawsuit.html>, archived at <http://perma.cc/4BP2-P7QH>. The Ninth Circuit refused to entertain the technology companies’ request to overturn the class certification. Michael Lipkin, *9th Circ. Upholds Cert. in Worker Poaching Pact Antitrust Suit*, LAW360 (Jan. 14, 2014, 10:03 PM), <http://www.law360.com/articles/501359/9th-circ-upholds-cert-in-worker-poaching-pact-antitrust-suit>, archived at <http://perma.cc/PY6Z-KKYL>.

277. See Shareholder Derivative Complaint at 37, 39, 40–41, 59, *Shah v. Brin*, No. 1-14-cv-264512 (Cal. Super. Ct. filed Apr. 29, 2014) (presenting evidence that these companies were on Google’s “do not cold call” and “sensitive” companies lists).

278. David Streitfeld, *Engineers Allege Hiring Collusion in Silicon Valley*, N.Y. TIMES, Feb. 28, 2014, http://www.nytimes.com/2014/03/01/technology/engineers-allege-hiring-collusion-in-silicon-valley.html?_r=0, archived at <http://perma.cc/TJT6-2PR5>.

279. Shareholder Derivative Complaint, *supra* note 277, at 21.

280. *Id.*

281. Streitfeld, *supra* note 278.

282. Shareholder Derivative Complaint, *supra* note 277, at 32–33.

283. *Id.* at 33.

284. *Id.* at 47.

285. See *id.* at 58 fig.28 (containing an e-mail about Google’s collusion with eBay beginning with a warning: “DO NOT FORWARD”).

286. Josh Harkinson, *“I Don’t Want to Create a Paper Trail”: Inside the Secret Apple–Google Pact*, MOTHER JONES, Feb. 19, 2014, <http://www.motherjones.com/politics/2014/02/google-apple-class-action-poaching-steve-jobs-wage-theft>, archived at <http://perma.cc/5UTN-FX6Q>.

These no-poaching practices likely led to significant hiring and innovation problems for the companies themselves, as evidenced by Google's internal memos that reveal the difficulties teams had in filling spots and maintaining their innovative edge.²⁸⁷ Consequently, in addition to the employee class action, another class action was recently filed against Google by its shareholders.²⁸⁸ The shareholder derivative action seeks to recover damages, caused by Google's high-level executives, for the illegal nonsolicitation agreements that "not only hurt employees of these companies, but also the companies themselves because Silicon Valley's innovation is based in large part on the frequent turnover of employees, which causes information diffusion and spurs innovation."²⁸⁹ Specifically, the shareholder suit claims that Google's executives violated the company's own code of conduct, which states that Google "strive[s] to hire the best employees, with backgrounds and perspectives as diverse as our global users. . . . Competition for qualified personnel in our industry is intense, particularly for software engineers, computer scientists, and other technical staff."²⁹⁰

In early August 2014, the tech workers and the defendants in this class action suit agreed to a \$324.5 million settlement, but the district court judge, Lucy Koh, denied preliminary approval to this settlement agreement.²⁹¹ Even more recently, another class action suit was filed against Disney, DreamWorks, Lucasfilm Ltd., and Sony Pictures Animation for their "agree[ments] to not poach each other's workers."²⁹² Robert A. Nitsch Jr., who worked at DreamWorks, filed this suit and alleged that "[d]efendants conspired not to actively solicit each other's employees and to fix their employees' wage and salary ranges as part of one overarching conspiracy to suppress the compensation of their employees and other class members."²⁹³

Notably, the flipside of such collusive agreements are cases that deem the inducement of employees of other companies to leave their employer as actionable. A Pennsylvania court, for example, explained "systematically inducing employees to leave their present employment is actionable 'when the purpose of such enticement is to cripple and destroy an integral part of a competitive business organization rather than to obtain the services of particularly gifted or skilled employ[ees].'"²⁹⁴ The irony of the Silicon Valley cognitive cartel is that it occurred precisely in the region that has most

287. Shareholder Derivative Complaint, *supra* note 277, at 63.

288. *Shah v. Brin*, No. 1-14-cv-264512 (Cal. Super. Ct. filed Apr. 29, 2014).

289. Shareholder Derivative Complaint, *supra* note 277, at 1.

290. *Id.* at 15–16 (internal quotation marks omitted).

291. Ryan Faughnder, *DreamWorks Animation, Disney Sued Over Alleged No-Poaching Scheme*, LA TIMES, Sept. 8, 2014, <http://www.latimes.com/entertainment/envelope/cotown/la-et-ct-dwa-disney-sued-poaching-20140908-story.html>, archived at <http://perma.cc/6NP6-7JX3>.

292. *Id.*

293. *Id.* (internal quotation marks omitted).

294. *Boyce v. Smith-Edwards-Dunlap Co.*, 580 A.2d 1382, 1390 (Pa. Super. Ct. 1990) (quoting *Albee Homes, Inc. v. Caddie Homes, Inc.*, 207 A.2d 768, 771 (Pa. 1965)).

benefited from California's exceptional policy of voiding noncompete agreements.²⁹⁵

The DOJ called the cognitive cartels formed in Silicon Valley "blatant and egregious."²⁹⁶ When Intuit sent a recruiting flyer to an eBay employee, eBay CEO Meg Whitman immediately contacted top executives at Intuit asking them to "remind your folks not to send this stuff to eBay people."²⁹⁷ She told Google's Eric Schmidt that "recruiting practices are 'zero sum'" and that targeting eBay employees "driv[es] salaries up across the board," which, in "the valley's view," is an "unfair" practice.²⁹⁸ This exchange epitomizes the upside-down world of the new cognitive property: talent mobility is deemed an "unfair practice" while suppressing competition through human capital control becomes the norm. This pattern resonates with earlier IP debates, particularly in the copyright world. Larry Lessig famously lamented the gap between the early Disney years, when "to use the language of the Disney Corporation today, Walt Disney 'stole' Willie [which became Mickey Mouse] from Buster Keaton" and the reality today.²⁹⁹ While a large number of Disney's animated hits are derived from the Brothers Grimm fairy tales and culture icons, under contemporary realities with the strengthening of copyright protections, "no one can do to the Disney Corporation what Walt Disney did to the Brothers Grimm [and to Steamboat Bill]."³⁰⁰ The same is happening today in human capital law. Companies such as Apple and Google, which had benefited from the vibrant culture of innovation and mobility in Silicon Valley, have become entrenched in the notion of ownership over human capital, such that they aim to not let others do to them what they have done to others: recruit experienced employees. A final irony in this context should be noted. In the past few years, Silicon Valley leaders have been vocal about a talent drought, strongly advocating immigration reform to allow more flow of employees from around the world;³⁰¹ yet, these same high-tech leaders conspired to suppress the market for talent in their own region.

295. See Bruce Fallick et al., *Job-Hopping in Silicon Valley: Some Evidence Concerning the Microfoundations of a High-Technology Cluster*, 88 REV. ECON. & STAT. 472, 478 & tbl.2 (2006) (presenting data showing that intra-industry mobility is higher in Silicon Valley's computer industry than in those of other cities); Lee Fleming & Matt Marx, *Managing Creativity in Small Worlds*, CAL. MGMT. REV., Summer 2006, at 6, 15 (noting the proposition that "California proscription of non-compete agreements [is] the cause of Silicon Valley's greater job mobility").

296. Press Release, *supra* note 275.

297. *Id.*

298. Shareholder Derivative Complaint, *supra* note 277, at 57, 58 fig.28 (internal quotation marks omitted).

299. Lawrence Lessig, Professor, Stanford Law Sch., Free Culture: Keynote From OSCON 2002 (July 24, 2002) (transcript available at <http://archive.oreilly.com/pub/a/policy/2002/08/15/lesig.html>, archived at <http://perma.cc/5CQ7-ML2V>).

300. *Id.*

301. Lobel, *supra* note 232.

II. Dimensions of Knowledge: The Detrimental Layered Effects of Cognitive Property

The effects of contemporary human capital law, creating an ever-expanding realm of cognitive property, should be understood in relation to the multiple dimensions of human knowledge. In 1675, Sir Isaac Newton wrote in a letter to his rival Robert Hook: “If I have seen further [than you and Descartes] it is by standing on [the shoulders] of Giants.”³⁰² Every great innovator—artist, engineer, scientist, and author—in history stood upon the shoulders of giants, and it is inherently the nature of knowledge to fertilize more knowledge. Stripping individuals of the wealth of knowledge and experience they carry has detrimental effects on innovation, market competition, and economic growth. While some of these understandings are intuitive, new field and experimental research about knowledge flows and job mobility, enriched by contemporary economic analysis of innovation policy, presents a clearer understanding of the new cognitive property and its detrimental effects. The harms include the prevention of talented individuals from standing upon the shoulders of giants, sharing knowledge, and making use of their human capital. In turn, as the research shows, such restrictions stymie industry innovation and economic growth.

The following subparts unpack these concerns by developing a novel taxonomy of the multiple facets of knowledge as it inhabits contemporary talent pools. To fully understand the effects of the new cognitive property, we need to investigate the core building blocks of human knowledge and the stepping stones of innovation and progress. Human capital is the stock of knowledge in all its multiple forms that contributes to productive work, including knowledge that is noncodifiable as well as knowledge that expresses itself in skills and know-how, in relationships and networks, in creativity and motivation, and in the ability to disrupt and energize.

A. *Tacit Knowledge*

The new cognitive property should be understood as an attempt to capture not only codifiable but also noncodifiable knowledge, precisely the type of knowledge that intellectual property law leaves in the public domain. Nobel laureate Elinor Ostrom counseled: “An infinite amount of knowledge is waiting to be unearthed. The discovery of future knowledge is a common good and a treasure we owe to future generations. The challenge of today’s generation is to keep the pathways to discovery open.”³⁰³ Knowledge, however, is not merely a good to be unearthed, traded, and then bequeathed as “a treasure” to future generations. In its full breadth, knowledge cannot be captured by merely considering codified information—the kind that can be embedded in intellectual property. Knowledge is also the human skills,

302. ROBERT K. MERTON, ON THE SHOULDERS OF GIANTS 31 (1965).

303. Hess & Ostrom, *supra* note 8, at 3, 8.

communications, and know-how that exist within and between people. A useful way to understand the complexity of knowledge and its relation to human capital is that knowledge embodies a dual function: it exists as a thing external to the human mind, but it is also the foundation of our cognitive systems—to be human is to know. Gilbert Ryle identified the distinction between “knowing that” and “knowing how,”³⁰⁴ and renowned economist Fritz Machlup referred to the latter as “brainwork.”³⁰⁵ Michael Polanyi relatedly distinguished between connoisseurship—the art of knowing—and skills—the art of doing.³⁰⁶ In broader terms, spanning beyond any one individual, knowledge is both a resource society possesses and the very essence that constitutes a society.³⁰⁷

Even in the information age, when the digital sphere provides abundant access, knowledge exchanges still rely on direct human contact.³⁰⁸ There is a consensus in the literature that the effects of “knowledge flows are geographically localized.”³⁰⁹ Indeed, the differences between the quality of human capital has become key to understanding the challenges of economic development.³¹⁰ Despite global technology and the accessibility of information through the Internet, firms are far more likely to quote research from a local university than a distant university, as exemplified in patent applications.³¹¹

304. See GILBERT RYLE, *THE CONCEPT OF MIND* 27–32 (1949) (establishing the distinction between “knowing that” and “knowing how,” where “knowing how” indicates mastery and skill at a particular task).

305. See FRITZ MACHLUP, *THE PRODUCTION AND DISTRIBUTION OF KNOWLEDGE IN THE UNITED STATES* 379–80 (1962) (referring to work completed by human workers—as opposed to automated workers—as brain work, particularly when involving a degree of expertise).

306. MICHAEL POLANYI, *PERSONAL KNOWLEDGE: TOWARDS A POST-CRITICAL PHILOSOPHY* 54 (1958).

307. See generally J.H. Reichman & Jonathan A. Franklin, *Privately Legislated Intellectual Property Rights: Reconciling Freedom of Contract with Public Good Uses of Information*, 147 U. PA. L. REV. 875 (1999) (discussing the modern tension between contractual control of knowledge and society’s benefit from the free spread of knowledge).

308. See Pankaj Ghemawat, *Why the World Isn’t Flat*, FOREIGN POL’Y, Mar.–Apr. 2007, at 54, 54, available at http://www.foreignpolicy.com/articles/2007/02/14/why_the_world_isnt_flat, archived at <http://perma.cc/DF9Z-9YFC> (showing that, despite appearances to the contrary, the vast majority of information and economic exchange takes place at the local level).

309. Ajay Agrawal et al., *Gone but Not Forgotten: Knowledge Flows, Labor Mobility, and Enduring Social Relationships*, 6 J. ECON. GEOGRAPHY 571, 571 (2006); see also Peter Thompson & Melanie Fox-Kean, *Patent Citations and the Geography of Knowledge Spillovers: A Reassessment*, 95 AM. ECON. REV. 450, 450 (2005).

310. See generally PAUL KRUGMAN, *GEOGRAPHY AND TRADE* (1991) (arguing that economics are affected by geography, leading producers to concentrate in locations with high demand and quality inputs).

311. See Paul Almeida & Bruce Kogut, *Localization of Knowledge and the Mobility of Engineers in Regional Networks*, 45 MGMT. SCI. 905, 915 (1999) (reporting that mobility has increased the probability that a patent will cite to a patent in the same region); Adam B. Jaffe et al., *Geographic Localization of Knowledge Spillovers as Evidenced by Patent Citations*, 108 Q. J. ECON. 577, 591 (1993) (finding “significant evidence” that patent citations are more localized than would be expected).

Tacit knowledge is particularly localized compared to written knowledge precisely because it is embedded in people. Knowledge remains tacit, rather than codified, for two reasons. First, certain types of knowledge by their nature simply cannot be written down. As Polanyi put it: “We can know more than we can tell.”³¹² This is why tacit knowledge is difficult to transmit through a patent document or a scientific journal.³¹³ Second, even when knowledge is amenable to codification, those holding the knowledge often lack incentive to codify it.³¹⁴ Direct interactions between people are thus the primary vehicle of transmitting these aspects of knowledge. Given that information is not fully captured by sources outside the minds of individuals, knowledge flows in the market through employee mobility and professional interaction. Kenneth Arrow hailed mobility of employees as a central way of spreading information.³¹⁵ As Dan Burk put it, uncodified knowledge “moves only with the humans who carry it.”³¹⁶

B. *Relational and Networked Knowledge*

Relationships spur innovation. In part, it is the existence of tacit knowledge that drives the formation of social ties and a professional community.³¹⁷ Knowledge flows between people through relationships. These relationships continue after people move jobs, forming professional connections where past colleagues remain acquaintances and potential collaborators. But beyond the flow of tacit knowledge, relationships create opportunities for connecting between distinct types of knowledge and ideas. A series of recent studies test the importance of collaboration between professionals over time. Several important insights arise from this body of research. First, the existence of professional ties highly impacts the likelihood of individual entrepreneurial activity.³¹⁸ These relationships

312. MICHAEL POLANYI, *THE TACIT DIMENSION* 4 (Anchor Books 1967) (1966) (emphasis omitted).

313. See generally Peter Lee, *Transcending the Tacit Dimension: Patents, Relationships, and Organizational Integration in Technology Transfer*, 100 CALIF. L. REV. 1503 (2012) (discussing the nature of tacit knowledge, the difficulty of transmitting tacit knowledge, and the implications this difficulty has for intellectual property law).

314. Ajay Agrawal, *Engaging the Inventor: Exploring Licensing Strategies for University Inventions and the Role of Latent Knowledge*, 27 STRATEGIC MGMT. J. 63, 64 (2006).

315. Kenneth Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in *THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS* 609, 615 (Nat'l Bureau of Econ. Research ed., 1962).

316. Dan L. Burk, *The Role of Patent Law in Knowledge Codification*, 23 BERKELEY TECH. L.J. 1009, 1017 (2008).

317. See ZYGMUNT BAUMAN, *COMMUNITY: SEEKING SAFETY IN AN INSECURE WORLD* 11 (2001) (arguing that “community” is dependent upon shared tacit knowledge). See generally Hiroe Ishihara & Unai Pascual, *Social Capital in Community Level Environmental Governance: A Critique*, 68 ECOLOGICAL ECON. 1549 (2009) (discussing how social capital, combined with common knowledge and symbolic power, gives rise to collective action in a community).

318. Ramana Nanda & Jesper B. Sorensen, *Workplace Peers and Entrepreneurship*, 56 MGMT. SCI. 1116, 1120 (2010).

enable an individual to identify entrepreneurial opportunities and increase her motivation to pursue those opportunities, especially for an individual without exposure to entrepreneurship in her own family.³¹⁹ Second, relationships activate participation in collaborative efforts, and the more collaborators an individual has had, the more likely she is to participate again in a collaborative venture.³²⁰ Third, and perhaps most importantly, knowledge is not only relational but networked in the sense that the combined knowledge that exists within a region or a professional community impacts the future knowledge ventures of each individual. Contemporary research illuminates the ways knowledge is embedded in institutions.³²¹ Organizations, professional networks, and regions can be understood to have “DNA” in the sense of patterning individual processes. An impressive body of research demonstrates the ways that the richness of ties in a locality determine the quality and breadth of creativity found in that region.³²² When a regional network of inventors is dense, the number of future inventions coming out of that region will significantly increase.³²³ The more people in contact, the more productive each member of that network. Dense metropolitan areas enjoy a significant rise in the number of patents *per capita* when compared to the number of patents per capita in areas that are less dense.³²⁴ Geographic density of creative ventures provides a space for professional meetings, face-to-face interactions, and long-term social connections. As the flow of human capital increases, the density of networks facilitates the diffusion of complex information, and the quality of the knowledge network itself improves. The loss that stems from controlling human interactions and flow is therefore different and indeed greater than the formal knowledge that any single individual may possess.³²⁵

319. *Id.* at 1124. In this sense, market relationships serve as a substitute for community ties and are thus a significant equalizer.

320. Jasjit Singh, *Collaborative Networks as Determinants of Knowledge Diffusion Processes*, 51 *MGMT. SCI.* 756, 757 (2005).

321. See generally Orly Lobel, *The Four Pillars of Work Law*, 104 *MICH. L. REV.* 1539 (2006) (book review) (discussing modern employment law and its interplay with complex modern institutions).

322. See generally Peter V. Marsden & Noah E. Friedkin, *Network Studies of Social Influence*, 22 *SOC. METHODS & RES.* 127 (1993) (analyzing a number of studies and models that have explored the influence that social networks have upon the actors within those networks).

323. Cf. Morten T. Hansen, *The Search-Transfer Problem: The Role of Weak Ties in Sharing Knowledge Across Organization Subunits*, 44 *ADMIN. SCI. Q.* 82, 107–09 (1999) (finding that ties established broadly between product development teams, even weak ties, will facilitate the spread of knowledge and lead to greater development).

324. Gerald A. Carlino et al., *Urban Density and the Rate of Invention*, 61 *J. URB. ECON.* 389, 390 (2007).

325. Relational and networked knowledge is related to the concept of social capital, which is distinct from intellectual capital. While intellectual capital (or formal knowledge) can be transferred through education, social capital is embedded in our daily interactions. Pierre Bourdieu, *The Forms of Capital*, in *HANDBOOK OF THEORY AND RESEARCH FOR THE SOCIOLOGY OF EDUCATION* 241, 248–49 (John G. Richardson ed., 1986); James S. Coleman, *Social Capital in the Creation of Human Capital*, 94 *AM. J. SOC.* S95, S98 (Supp. 1988). Bourdieu defined social capital as the aggregate

C. *Motivational & Disruptive Knowledge*

In the new knowledge economy, human capital has become a premier resource that gives companies their competitive edge. And yet, human capital is not a static resource in the way real estate or building materials serve a construction company. Human capital is both a resource and a living subject that makes constant judgments, decisions, and choices about the quantity and quality of outputs. Put differently, human capital is a resource with built-in motivation. Quite intuitively, noncompetes, trade secrets, and other controls over human capital, which strip individuals from ownership over their skills, knowledge, experiences, and future competitiveness, may decrease the drive to effectively employ one's cognitive energies. In other words, the new cognitive property not only commodifies intangible knowledge beyond the bounds of intellectual property, it changes the quality of that knowledge. In general, employees are discouraged from investing in their human capital when interfirm competition is less likely to occur.³²⁶ Motivation is also reduced when employees whose human capital is propertyized have fewer prospects to receive credit and attribution for their work,³²⁷ reduced expectations of profit from their innovation, and fewer entrepreneurial opportunities. The background rules of ownership over the human capital alter the very quality of the resource at stake.

In recent behavioral studies conducted with my collaborator On Amir, we set up an experimental lab designed to identify the effect of human capital controls and contractual arrangements on performance and motivation. In our study, participants in an e-lab experiment were asked to perform tasks.³²⁸ Those participants who were asked to sign human capital restrictions on

resources that are linked to a network. Bourdieu, *supra*, at 248. Coleman defined social capital functionally as anything that supports productive activity through social norms, reciprocity, and trust. Coleman, *supra*, at S98. Indeed, there are rich debates between economists and sociologists on the definition of social capital as a form of capital or as a social structure. See Kenneth J. Arrow, *Observations on Social Capital*, in SOCIAL CAPITAL: A MULTIFACETED PERSPECTIVE 3, 4 (Partha Dasgupta & Ismail Serageldin eds., 2000) (warning that the concept of social capital "may be a snare and a delusion"); Robert M. Solow, *Notes on Social Capital and Economic Performance*, in SOCIAL CAPITAL: A MULTIFACETED PERSPECTIVE, *supra*, at 6, 6 (criticizing the modern concept of social capital). See generally BEN FINE, SOCIAL CAPITAL VERSUS SOCIAL THEORY (2001) (analyzing the state of the philosophy of social capital at the beginning of the twenty-first century). Importantly for this Article, relational and networked knowledge, or the sociological concept of social capital, is viewed as a functional structure that is one aspect of human capital.

326. See On Amir & Orly Lobel, *Driving Performance: A Growth Theory of Noncompete Law*, 16 STAN. TECH. L. REV. 833, 863–64 (2013) [hereinafter Amir & Lobel, *Driving Performance*] (arguing that noncompetes may stifle motivation to complete difficult tasks); On Amir & Orly Lobel, *How Noncompetes Stifle Performance*, HARV. BUS. REV., Jan.–Feb. 2014, at 26, 26 (finding the subjects of a study to be much less motivated to expend effort when subject to fictional noncompetes).

327. Cf. Christopher Sprigman et al., *What's A Name Worth?: Experimental Tests of the Value of Attribution in Intellectual Property*, 93 B.U. L. REV. 1389, 1425 (2013) (finding that creators value attribution and are willing to reduce their monetary compensation in return for receiving attribution).

328. Amir & Lobel, *Driving Performance*, *supra* note 326, at 852.

future employment in our online job market performed worse on their tasks and were more likely to quit before the end of the experiment.³²⁹ The findings suggest that participants bound by other postemployment restrictions are less motivated to stay on task than those not bound.³³⁰ Recent field data supports these experimental findings, showing that, contrary to traditional economic analysis, companies invest *less* in research and human capital development when noncompetes are strongly enforced,³³¹ providing further evidence that investment decisions are affected by workers themselves in their assessments on their own ability to move to, or to be recruited by, a different company. These findings suggest that the new cognitive property, which strips employees from ownership over their human capital, not only restricts mobility and knowledge flow but also reduces incentives to innovate.

New economic models further help explain why people are more motivated to invest in their own human capital when they do not know the precise job that they will eventually hold.³³² Companies are also incentivized to invest in technology and skill development when they do not know whom they will continue to hire.³³³ MIT economist Daron Acemoglu describes the fertile conditions of uncertainty as forming a virtuous circle of human capital development: when workers invest more in their human capital, businesses will invest more in innovation because of the prospect of acquiring good talent.³³⁴ Consequently, workers will invest more in their human capital as they may end up in one, or several, of these companies. In other words, in Acemoglu's model the likelihood of finding good employees creates incentives for overall investments in human capital. Yet, empirical research shows that in most places there is an underinvestment in human capital.³³⁵ The trend toward expanding cognitive property can help explain this underinvestment: the new cognitive property not only impedes the flow of knowledge and reduces the positive effects of market uncertainty but also undercuts the likelihood of being able to employ good employees. Consequently, the incentives and motivation to invest in human capital are lowered.

329. *Id.* at 854–55.

330. *Id.* at 855.

331. Mark J. Garmaise, *Ties that Truly Bind: Noncompetition Agreements, Executive Compensation, and Firm Investment*, 27 J.L. ECON. & ORG. 376, 408–10 (2011).

332. *See, e.g.*, Daron Acemoglu, *Patterns of Skill Premia*, 70 REV. ECON. STUD. 199, 199 (2003) (introducing a model that demonstrates the growing importance of human skills in new international and technological fields).

333. *See id.* at 216 (arguing that the presence of a higher supply of skilled workers leads to greater investment in further skill development).

334. *See id.* at 216, 220 (asserting that workers' own investments in human capital increases the supply of skilled workers, which increases the market size for skill-intensive jobs, which encourages further investment in workers' skills).

335. *See* Daron Acemoglu & David Autor, *What Does Human Capital Do? A Review of Goldin and Katz's The Race Between Education and Technology*, 50 J. ECON. LITERATURE 426, 427 (2012) (book review) (noting that underinvestment in intellectual capital in the United States in recent years has led to an increase in inequality).

Finally, the background rules that shape ownership and control over human capital also impact the degree to which knowledge can be disruptive and used to generate new ideas. Phenomena like Not Invented Here (NIH)—an institutional pathology that prevents groups from benefiting from outside knowledge³³⁶—and groupthink—where cohesive groups overlook important alternatives because of the desire for consensus and conformity³³⁷—are mitigated by the flow of “new blood” to the organization. Even in today’s globalized market, research shows that firms often to their detriment overlook outside ideas and solutions simply from an NIH mindset and because groups become entrenched in traditional methods.³³⁸ This counterproductive lock in happens in greater frequency where there is little turnover and companies are overly stable. In one study, teams with little turnover became progressively less productive.³³⁹ Firms in remote locations with stable personnel are more likely to draw upon the inventions of their own firm and to draw upon the same set of prior inventions compared to firms in more diverse locations.³⁴⁰ From this perspective, cognitive property hinders institutional openness, the absorptive capacity of firms, and firms’ ability to identify and make use of good ideas. The rich texture of knowledge, an economic resource, is diminished from both the motivational and transformative perspectives.

III. The Third Enclosure Movement

A. *From Monopoly to Property*

The law locks up the man or woman
Who steals the goose from off the common
But leaves the greater villain loose
Who steals the common from off the goose.

—Anonymous³⁴¹

336. See Ajay Agrawal et al., *Not Invented Here? Innovation in Company Towns*, 67 J. URB. ECON. 78, 80 (2010) (observing that inventors in isolated company towns are more likely to draw upon the same set of limited ideas from year to year but that small firms located within such towns are more likely to draw upon diverse outside influences).

337. Avishalom Tor, *Understanding Behavioral Antitrust*, 92 TEXAS L. REV. 573, 642 & n.360 (2014).

338. See Ralph Katz & Thomas J. Allen, *Investigating the Not Invented Here (NIH) Syndrome: A Look at the Performance, Tenure, and Communication Patterns of 50 R & D Project Groups*, 12 R&D MGMT. 7, 7–8 (1982) (finding that project-team members tend to become more specialized and isolated over time, losing touch with current developments in their fields and developing NIH syndrome).

339. *Id.* at 10.

340. Agrawal et al., *supra* note 336, at 80.

341. James Boyle, *The Second Enclosure Movement and the Construction of Public Domain*, LAW & CONTEMP. PROBS., Winter–Spring 2003, at 33, 33 & n.1 (quoting an anonymous English poem) (emphasis omitted).

In 1964, Charles Reich wrote: “The institution called property guards the troubled boundary between individual man and the state.”³⁴² Reich defined “new property” as intangibles like income, benefits, occupational licenses, and franchises that were all governed by the legal rules and directed the distribution of wealth in society.³⁴³ Reich argued that the new reliance on these forms of wealth, highly dependent on legal regulation, has become akin to traditional forms of property.³⁴⁴ In the past few decades, reliance on legal regimes that create wealth in intangibles has risen dramatically. Today, as law continues to delineate the boundaries between individual, market, and state, we face a new propertization of the building blocks of society: human knowledge in all its facets.

Merely a decade ago, James Boyle warned of the “second enclosure movement,” referring to this movement as the legal enclosure of the “intangible commons of the mind” by a rapid expansion of intellectual property rights.³⁴⁵ Boyle warned against the expansion of copyright and patent protections, the *outputs* of innovation and human creativity.³⁴⁶ The new cognitive property expands propertization of the intangibles of the mind beyond the heated IP wars, which have shaped the last two decades. While controversies around the expansion of IP continue, we now face the “third enclosure movement,” the under-the-radar enclosure over the *inputs* of knowledge—the creation of property over human capital. Knowledge, experience, skill, creativity, and network are all becoming subject to commodification and litigation.

To understand these developments, it is illuminating to know the history of IP, which is characterized by a shift from the lens of antitrust to the lens of property. If, in the past, patent and copyright protections were understood as state-sanctioned partial monopolies to reward invention, now IP is understood as market assets protected by legal rules. In his canonical 1935 realist essay, *Transcendental Nonsense and the Functional Approach*, Felix Cohen lamented the forgotten logic of IP law designed to aid market competition and instead adopted a formalist view of IP as property: “Increasingly the courts have departed from any such theory and have come

342. Charles A. Reich, *The New Property*, 73 YALE L.J. 733, 733 (1964).

343. *Id.*

344. *Id.*

345. Boyle, *supra* note 341, at 37. The first enclosure movement concerned the expansion of real property and the debates surrounding the effect of private property on the social contract and wealth distribution. *Id.* at 33–36. See generally J.A. YELLING, COMMON FIELD AND ENCLOSURE IN ENGLAND 1450–1850 (1977) (chronicling the complex history of parliamentary enclosure in England over hundreds of years).

346. See Boyle, *supra* note 341, at 40, 49–50 (criticizing the expansion of patentable and copyrightable subject matter because of the potential costs and the lack of “convincing” evidence that expansion benefits innovation).

to view this branch of law as a protection of property rights in divers[e] economically valuable sale devices.”³⁴⁷

Cohen warned that courts and scholars have become trapped in a vicious circle of labeling IP as a “thing of value” and thereby as property, while refusing to admit any extralegal facts to challenge this entrenched conception.³⁴⁸ Cohen explained the inherent circularity in the conception of intangible goods as property:

It purports to base legal protection upon economic value, when, as a matter of actual fact, the economic value of a sales device depends upon the extent to which it will be legally protected. . . .

The circularity of legal reasoning in the whole field of unfair competition is veiled by the “thingification” of *property*.³⁴⁹

William Fisher similarly described the coming of age of IP rights as a shift from the field of antitrust with the terminology of “monopolies” to the field of property with the terminology of “rights.”³⁵⁰ As Fisher suggested, the currency of the term monopoly “derived partly from—and helped to reinforce—a substantive position: like other ‘monopolies,’ patents and copyrights were dangerous devices that should be deployed only when absolutely necessary to advance some clear public interest.”³⁵¹ By the twentieth century however, “[f]raming arguments in terms of property rights became increasingly common” in patent, copyright, and trademark disputes.³⁵² Still, the term itself, “intellectual property,” was rare until the second half of the twentieth century.³⁵³ Under contemporary law, however, “the use of the term ‘property’ to describe copyrights, patents, trademarks, etc. conveys the impression that they are fundamentally ‘like’ interests in land or tangible personal property—and should be protected with the same generous panoply of remedies.”³⁵⁴ Unsurprisingly then, courts have increasingly been intent on construing misappropriation of IP as outright

347. Felix S. Cohen, *Transcendental Nonsense and the Functional Approach*, 35 COLUM. L. REV. 809, 814 (1935).

348. *Id.* at 815–16.

349. *Id.* at 815.

350. William W. Fisher III, *Geistiges Eigentum—Ein Ausufernder Rechtsbereich: Die Geschichte des Ideenschutzes in den Vereinigten Staaten*, in EIGENTUM IM INTERNATIONALEN VERGLEICH 265 (Hannes Siegrist & David Sugarman eds., 1999), translated in William W. Fisher III, *The Growth of Intellectual Property: A History of the Ownership of Ideas in the United States* 20–23 (1999) (unpublished manuscript), available at <http://cyber.law.harvard.edu/people/tfisher/iphistory.pdf>, archived at <http://perma.cc/R84P-FRZS>; see also Michael A. Carrier, *Cabining Intellectual Property Through a Property Paradigm*, 54 DUKE L.J. 1, 4–8 (2004) (outlining the “revolutionary” legal change of the “propertization” of IP law and proposing limits to correct the imbalance); cf. Edward C. Walterscheid, *Essay, Patents and the Jeffersonian Mythology*, 29 J. MARSHALL L. REV. 269, 269–71 (1995) (reviewing Thomas Jefferson’s role in patent law and offering perspective on his influence in current interpretations of patent law).

351. Fisher, *supra* note 350, at 20.

352. *Id.* at 21.

353. *Id.* at 22.

354. *Id.*

theft. In a recent copyright case, a federal district court began its opinion about rap music recalling the biblical statement: “‘Thou shalt not steal.’ has been an admonition followed since the dawn of civilization.”³⁵⁵

This ever-expanding lens of property into the intangibles of the mind is now reaching the next frontier, targeting not only the outputs of innovation but also people themselves. Once knowledge in all its forms is labeled property, its unauthorized use is deemed theft. As we have seen above, the same lens of theft and property has become increasingly strong in human capital law cases and legislation, including both the expansion of human capital controls and the increased criminalization of trade secrets. A striking illustration of this expansion is the use of the term “piracy” in relation to human capital. The term “piracy” has been a significant metaphor in defense of strong IP protections.³⁵⁶ Unsurprisingly, as propretization shifts beyond specific information and into the zone of human capital, claims about piracy are carried over into battles to control cognitive capacity. For example, a recent article describes employees, who dare to dream of becoming entrepreneurs despite signing noncompetes, as modern day pirates. The article quotes an attorney who explains the difference between these new pirates and the old swashbucklers:

The owner of a merchant vessel clearly knows when his ship comes under pirate attack. Buccaneers armed with cutlasses board his vessel. In the workplace, employee pirates steal an employer’s treasure—trade secrets, proprietary information and customer relationships.

Unlike sea pirates . . . this theft is often carried out by trusted, supposedly honest employees.³⁵⁷

The new pirates are stealing their human capital away from the firm. In 1414, the earliest known case on noncompetes, a clothes dyer in medieval England attempted to prevent a former employee from competing in town for six months.³⁵⁸ The court threatened to imprison the employer for initiating such a frivolous lawsuit that restrained trade.³⁵⁹ If under the lens of antitrust, harm is done by he who attempts to restrain competition and the use of

355. *Grand Upright Music Ltd. v. Warner Bros. Records, Inc.*, 780 F. Supp. 182, 183 (S.D.N.Y. 1991) (quoting *Exodus* 20:15).

356. See, e.g., Marshall A. Leaffer, *Protecting United States Intellectual Property Abroad: Toward a New Multilateralism*, 76 IOWA L. REV. 273, 274–75 (1991) (advocating for increased intellectual property protection in the United States because of an increasing vulnerability to piracy); Mike Belleville, Note, *IP Wars: SOPA, PIPA, and the Fight Over Online Piracy*, 26 TEMP. INT’L & COMP. L.J. 303, 333–34 (2012) (noting that because new piracy threats constantly emerge, stronger enforcement mechanisms must be made).

357. Lynne Curry, *Keep an Eye Out for Pirate Employees*, ALASKA DISPATCH NEWS (Feb. 23, 2014) (internal quotation marks omitted), <http://www.adn.com/article/20140223/lynne-curry-keep-eye-out-pirate-employees>, archived at <http://perma.cc/HRY8-N8U6>.

358. Harlan M. Blake, *Employee Agreements Not to Compete*, 73 HARV. L. REV. 625, 631, 635–36 (1960).

359. See *id.* at 636 & n.33 (quoting the judge’s declaration: “By God, if the plaintiff were here he would go to prison until he paid a fine to the King”).

experience and skill in markets; under the lens of property, the dramatically evolved law of human capital views he who harms as the one who resists such restraints.

B. *Understanding Harm*

Rather than equating employees with pirates, the challenge of our coming decades is to rid adjudication from the strains of a property paradigm and to urge serious analysis of the implications of economic arrangements surrounding human capital. Debates about human capital law have been rather thin and traditionally tracked the general IP debate. The long-unchallenged assumption has been that human capital controls are necessary because otherwise employers would underinvest in employee training.³⁶⁰ In other words, the move toward cognitive property is necessary to incentivize corporate investment.³⁶¹ Under the traditional analysis, externalities are a type of market failure. Just as tort liability aims to internalize negative externalities—the harm to others—knowledge monopolies are viewed as necessary to internalize positive externalities—or spillovers—that flow from innovation.³⁶²

The view that IP law is necessary to allow firms to internalize positive externalities has been challenged in recent years. Scholars such as Brett Frischmann and Mark Lemley have argued that in the context of intellectual property, internalization is not a desirable goal and that spillovers actually encourage *greater* innovation.³⁶³ In human capital law, these questions have remained underinvestigated despite mounting evidence that the challenge to conventional economic reasoning in this context is even more compelling.

Contemporary research suggests that a human capital spillover should not be understood as a market failure, but as a constitutive part of the market itself. In 1813 Thomas Jefferson wrote: “If nature has made any one thing less susceptible than all others of exclusive property, it is the action of the thinking power called an idea”³⁶⁴ And yet, knowledge, information, and ideas have increasingly become the subject of exclusive property. At the same time, new research overwhelmingly points to a clear connection between human capital flow and economic growth. As the previous sections

360. See GARY S. BECKER, HUMAN CAPITAL 34 (3d ed. 1993) (theorizing that firms would be unwilling to invest in general training if they could not protect their investment).

361. See Eric Posner et al., *Investing in Human Capital: The Efficiency of Covenants Not to Compete* 1 (Univ. of Chi. Law & Econ., Olin Working Paper No. 137, 2004), available at <http://ssrn.com/abstract=285805>, archived at <http://perma.cc/A4WV-FD29> (noting the argument that covenants not to compete are beneficial because they protect human capital investment).

362. See Brett M. Frischmann & Mark A. Lemley, Essay, *Spillovers*, 107 COLUM. L. REV. 257, 264–66 (2007) (describing the argument that private property law should internalize benefits derived from that property to encourage investment in the property).

363. *Id.* at 258.

364. Letter from Thomas Jefferson to Isaac McPherson (Aug. 13, 1813), in 13 THE WRITINGS OF THOMAS JEFFERSON 326, 333 (Albert Ellery Bergh ed., 1907).

have shown, human capital law has developed as a patchwork, consisting of important jurisdictional variations. Recent empirical studies in innovation exploit these natural experiments in human capital law.³⁶⁵ In several recent studies, examining dozens of regions across the United States, human capital restrictions were found to impede not only job mobility but also innovation and entrepreneurship.³⁶⁶ Mobility in the labor market is correlated with increased competition, deployment of skills in the market, densification of knowledge networks, and knowledge spillovers.³⁶⁷ Running in direct contrast to the simplified predictions that more controls increase growth and innovation, empirical findings suggest that firms increase their research and development efforts and expenditures when employee turnover and knowledge spillovers increase.³⁶⁸ New models of economic growth help link human capital flows and regional success.³⁶⁹ For many years, economists have attempted to answer a key puzzle: why do similarly situated regions vary so dramatically in their growth rates? Under endogenous-growth theory, economic growth relies not simply on competitive win-lose production but on processes of positive spillovers, in which knowledge is transferred within industries and regions.³⁷⁰ Endogenous-growth theory

365. See, e.g., Matt Marx et al., *Mobility, Skills, and the Michigan Non-Compete Experiment*, 55 MGMT. SCI. 875, 875–76 (2009) (utilizing Michigan’s change in noncompete enforcement to study the effects of noncompetes on employee mobility).

366. See Almeida & Kogut, *supra* note 311, at 916 (concluding that the mobility of engineers in a region affects the distribution of knowledge in that region); Lee Fleming & Koen Frenken, *The Evolution of Inventor Networks in the Silicon Valley and Boston Regions*, 10 ADVANCES COMPLEX SYS., 53, 54–55 (2007) (suggesting employee mobility as a source of increased interorganizational collaboration and noting that this research is consistent with other research supporting relaxed enforcement of noncompetes); Jiang He & M. Hosein Fallah, *Is Inventor Network Structure a Predictor of Cluster Evolution?*, 76 TECH. FORECASTING & SOC. CHANGE 91, 103–04 (2009) (concluding that a region of inventors in which most inventors work for the same company is not as conducive to innovation as one in which inventors freely move between multiple companies); Sampsa Samila & Olav Sorenson, *Noncompete Covenants: Incentives to Innovate or Impediments to Growth*, 57 MGMT. SCI. 425, 436 (2011) (finding that the enforcement of noncompete clauses impedes entrepreneurship and innovation).

367. See, e.g., David B. Audretsch & Maryann P. Feldman, *R&D Spillovers and the Geography of Innovation and Production*, 86 AM. ECON. REV. 630, 639 (1996) (finding that industries in which knowledge spillovers are more common are more likely to geographically cluster); Tomas Havranek & Zuzana Irsova, *Estimating Vertical Spillovers from FDI: Why Results Vary and What the True Effect Is*, 85 J. INT’L ECON. 234, 234–36, 243 (2011) (analyzing studies of spillovers in numerous countries to find that spillovers of outside knowledge into a country increase the productivity of domestic firms).

368. See Almeida & Kogut, *supra* note 311, at 915 (finding that firms build upon knowledge acquired through spillovers); G.V. Graevenitz, *Spillovers Reconsidered: Analysing Economic Welfare Under Complementarities in R&D* 16 (Nov. 21, 2004) (unpublished manuscript), available at <http://ssrn.com/abstract=625142>, archived at <http://perma.cc/8UJQ-MJRH> (finding that the “spillover process induces a supermodular game in R&D investment”).

369. See Robert Lucas, *Why Doesn’t Capital Flow from Rich to Poor Countries*, 80 AM. ECON. REV. (PAPERS & PROC.) 92, 96 (1990) (concluding that the accumulation of human capital is important to regional success); Paul M. Romer, *Increasing Returns and Long-Run Growth*, 94 J. POL. ECON. 1002, 1034–35 (1986) (developing a model linking knowledge and capital that can be used in future research).

370. Paul M. Romer, *The Origins of Endogenous Growth*, 8 J. ECON. PERP. 3, 7 (1994).

favors investment in human capital as the central ingredient for economic success. Mobility triggers an upward cycle to create agglomeration economies.³⁷¹ Regions that encourage human capital mobility are also able to attract more human capital from other regions.³⁷² High employee turnover, regional human capital concentration, and density of professional networks all contribute to economic growth.³⁷³

Instead of the simplified prediction that more controls over human capital will lead to more investment in human capital, the richer analysis of the effects of cognitive property coupled with the empirical findings suggests that the increased propertization of knowledge can have devastating effects. Drawing on the terms of commons–anticommons debates in property law, the underuse of people—the expansion of cognitive property—is perhaps the greatest tragedy of all.³⁷⁴ In blunt economic terms, the deadweight loss from controls and restrictions over human capital is the person herself who is prevented from using her talent, skill, and passion. Minds are made to suppress ideas, skill remains untapped, knowledge is cut up into small fragments, and people risk their very liberty to move through their careers.

Traditionally, IP regimes are purposely weak and partiality is built into the law. Patent and copyright protections are granted for a limited time and each have thresholds for receiving the right and defenses for certain uses.³⁷⁵ These laws also guarantee that the underlying information is disclosed to the public as part of the bargain of exclusivity.³⁷⁶ Looking through the lens of positive externalities, or spillovers, helps explain why these built-in weaknesses are a feature, not a flaw. IP laws are meant to promote progress, “not the creation of private fortunes for the owners of patents.”³⁷⁷ In human capital law, the bargain of a limited monopoly in return for disclosure is subverted. There is no public disclosure of secrets or cognitive ability that is fenced.

In delineating IP rights, the courts have been charged with policing the boundaries between proprietary information and knowledge that constitutes

371. See Paul M. Romer, *Endogenous Technological Change*, 98 J. POL. ECON. S71, S72–S73 (1990) (finding that a larger stock of human capital increases the rate of economic growth).

372. See Marx et al., *supra* note 243, at 9 (showing that employees are more likely to move to states with less vigorous noncompete enforcement).

373. Nicholas Bloom et al., *Identifying Technology Spillovers and Product Market Rivalry*, 81 ECONOMETRICA 1347, 1389–90 (2013), suggest that technology and product spillover contribute to overall economic growth. As has been shown, employee mobility and the density of regional human capital networks facilitate these spillovers. See *supra* notes 366–68 and accompanying text.

374. See Michael A. Heller, *The Tragedy of Anticommons: Property in the Transition from Marx to Markets*, 111 HARV. L. REV. 621, 687–88 (1998) (discussing that the tragedy of the anticommons is underutilization of property).

375. See 17 U.S.C. §§ 102, 302 (setting forth the basic requirements for obtaining and the durational limits on copyrights); 35 U.S.C. §§ 101, 154 (2012) (setting forth the basic requirements for obtaining and the durational limits on patents).

376. *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 496–97 (1974) (Douglas, J., dissenting).

377. *Bilski v. Kappos*, 561 U.S. 593, 648 n.44 (2010) (citing *Quanta Computer, Inc. v. LG Elecs., Inc.*, 553 U.S. 617, 626 (2008)).

the public domain. Courts regularly refuse to enforce contracts that attempt to restrict information that belongs in the public domain. The Supreme Court has stated that information “which is in the public domain cannot be removed therefrom by action of the States.”³⁷⁸ The Court has also held that the Copyright and Patent Clause of the Constitution³⁷⁹ prohibited Congress from recognizing rights in the subcopyrightable and subpatentable materials.³⁸⁰ The Supreme Court has warned that state trade secrecy law should not encourage secrecy over patenting, for example, by prohibiting reverse engineering.³⁸¹ In the context of patent licensing, the courts have held that states are prohibited from allowing tort claims to protect unpatented information, enforcing agreements to license patents after their expiration or enforcing royalty agreements for invalidated patents.³⁸² As the previous sections have explored, this wisdom has not been applied to the under-the-radar development of human capital law, which proptertizes knowledge that IP law has placed in the public domain.

C. *The Scorpion Always Stings*

While proptertizing knowledge—tacit, relational, networked, motivational, and disruptive—out of the public domain is in the market at large, the negative effects are also highly patterned. Litigation against former employees is “fueled by emotion as much as financial desire.”³⁸³ On the first page of Michael Lewis’ new book, *Flash Boys*, Lewis writes about Sergei Aleynikov’s imprisonment:

I’d thought it strange, after the financial crisis, in which Goldman had played such an important role, that the only Goldman Sachs employee who had been charged with any sort of crime was the employee who had taken something from Goldman Sachs.³⁸⁴

378. *Kewanee Oil*, 416 U.S. at 481.

379. U.S. CONST. art. I, § 8, cl. 8.

380. See *Feist Publ’ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 347–48 (1991) (holding that facts cannot be copyrighted because facts do not meet the originality requirement of copyright law and are, therefore, part of the public domain).

381. See *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 161 (1989) (“The protections of state trade secret law are most effective at the developmental stage, before a product has been marketed and the threat of reverse engineering becomes real.”); *Kewanee Oil*, 416 U.S. at 485 (stating that the patent policy of disclosure is not undermined by trade secret protection because the laws “encourage invention in areas where patent law does not reach”).

382. See *Lear, Inc. v. Adkins*, 395 U.S. 653, 670–71 (1969) (holding that a licensing contract could not preclude a licensee from challenging the validity of a patent); *Brulotte v. Thys Co.*, 379 U.S. 29, 30 (1964) (holding that royalties could not be collected when they accrued after all of the machine’s patents expired); Mark A. Lemley, *Beyond Preemption: The Law and Policy of Intellectual Property Licensing*, 87 CALIF. L. REV. 111, 126–27 (1999) (detailing the issues that arise when a patent licensor attempts to use state law to get more than federal patent law will allow).

383. William Lynch Schaller, *Jumping Ship: Legal Issues Relating to Employee Mobility in High Technology Industries*, 17 LAB. LAW. 25, 69 (2001).

384. LEWIS, *supra* note 109, at 1.

The new cognitive property benefits firms with superior resources. As Graves and DiBoise note: “[C]ourts do not recognize that plaintiff’s trade secret claims are too often created after the fact by attorneys to try to trap a former employee, and not so valuable that the plaintiff had previously recorded them as company intellectual property and guarded them as secret before the employee departed.”³⁸⁵ In general, newer and smaller firms are disadvantaged in IP litigation.³⁸⁶ Uncertain legal boundaries lead to over-enclosures of information by those with fewer resources, who thereby seek to avoid risk under conditions of unpredictability.³⁸⁷ In human capital law, these issues are exacerbated by the profound inherent asymmetries in reserves and information.³⁸⁸ As we have seen, human capital law is comprised from a nebulous set of rules that create uncertainty and chill the prospects of competition. The uncertainty and ad hoc balancing that characterizes human capital law incentivizes firms to deliberately draft human capital clauses broadly and vaguely. Far more than in the context of IP agreements between two companies, in the field of human capital law, employment contracts are typically boilerplate and negotiations are rare.³⁸⁹ In a recent Delaware case, a court enforced a clickwrap, boilerplate noncompete agreement that the employee received only as an electronic copy, buried as part of an equity compensation contract.³⁹⁰ The employee signed the contract by clicking “accept” on her computer screen. The court explained that although the way the employer sought agreement to the postemployment restrictive agreement was “certainly not the model of

385. Charles Tait Graves & James A. DiBoise, *Do Strict Trade Secret and Non-Competition Laws Obstruct Innovation?*, 1 ENTREPRENEURIAL BUS. L.J. 323, 339 (2006).

386. Rajshree Agarwal et al., *Reputations for Toughness in Patent Enforcement: Implications for Knowledge Spillovers Via Inventor Mobility*, 30 STRATEGIC MGMT. J. 1349, 1354 (2009); see also Erik Larson, *Modem Operandi: In High-Tech Industry, New Firms Often Get Fast Trip to Courtroom*, WALL ST. J., Aug. 14, 1984, at 1, 14 (reporting that the founders of start-ups are the most vulnerable victims of intellectual property lawsuits).

387. James Gibson, *Risk Aversion and Rights Accretion in Intellectual Property Law*, 116 YALE L.J. 882, 884–85 (2007).

388. See Albert Choi & George Triantis, *The Effect of Bargaining Power on Contract Design*, 98 VA. L. REV. 1665, 1712 (2012) (stating that the party with greater bargaining power “deliberately imposes inefficient terms to capture more of the contractual surplus”); Albert Choi & George Triantis, *Market Conditions and Contract Design: Variations in Debt Contracting*, 88 N.Y.U. L. REV. 51, 71 (2013) (stating that contract design is affected by bargaining leverage); Albert Choi & George Triantis, *Strategic Vagueness in Contract Design: The Case of Corporate Acquisitions*, 119 YALE L.J. 848, 888 (2010) (describing a risk of failure in contract negotiations when one or more party has private information).

389. Rachel Arnow-Richman, *Cubewrap Contracts and Worker Mobility: The Dilution of Employee Bargaining Power via Standard Form Noncompetes*, 2006 MICH. ST. L. REV. 963, 978.

390. *Newell Rubbermaid Inc. v. Storm*, No. 9398-VCN, 2014 WL 1266827, at *1 (Del. Ch. Mar. 27, 2014).

transparency and openness with its employees, [the postemployment restrictive contract] was not an improper form of contract formation.”³⁹¹

New research on predation and strategy demonstrates how corporate reputation for “toughness” in patent enforcement suppresses employee mobility. As firms signal that they are willing to be litigious against former employees, “employee-inventors become less likely to join or form rival companies.”³⁹² The research demonstrates how litigation against former employees reduces the expected value *all employees* have in pursuing external professional options, not merely the employees who actually left and were sued.³⁹³ In the context of litigation against a former employee turned competitor, “[e]ven if the costs of being litigious in a particular dispute outweigh the benefits, the deterrence of future knowledge spillovers can justify the investment.”³⁹⁴ In other words, human capital litigation risks being designed precisely to deter future mobility by other employees. The findings suggest that a firm’s patent litigiousness significantly lowers the dissemination of technical knowledge otherwise predicted to flow from employee mobility, leading the researchers to warn:

[T]he vitality of innovative regions such as Silicon Valley is widely attributed to active job hopping by skilled workers and the corresponding diffusion of technological know-how and discoveries across firm boundaries. If reputations for IP toughness curb the inter-firm dissemination of technological knowledge, particularly to start-ups, regional dynamics could be threatened.³⁹⁵

The new cognitive property creates a myriad of penalties on communication that lead to a slower diffusion of knowledge, with a special harm to entrepreneurship and the formation of start-ups,³⁹⁶ which are vital for the healthy growth of markets.³⁹⁷ For large, established firms, excluding employees from certain innovative activities mitigates the risks of cognitive property suits. New employers who desire to comply and not risk the civil and criminal implications of using cognitive property are likely to go through inefficient and disruptive inquisitive processes, including the exclusion of

391. *Id.* at *7 (footnote omitted). In another recent case, an Ohio federal court enforced a noncompetition agreement that the employee had never signed. *Pharmerica Corp. v. McElyea*, No. 1:14-CV-00774, 2014 WL 1876271, at *3–5 (N.D. Ohio May 9, 2014).

392. Martin Ganco et al., *More Stars Stay, But the Brightest Ones Still Leave: Job Hopping in the Shadow of Patent Enforcement*, STRATEGIC MGMT. J. (forthcoming 2015) (manuscript at 2), available at <http://onlinelibrary.wiley.com/doi/10.1002/smj.2239/pdf>, archived at <http://perma.cc/WP5F-GZ5B>.

393. *Id.* (manuscript at 18).

394. Agarwal et al., *supra* note 386, at 1354.

395. *Id.* at 1368 (citation omitted).

396. See Steven Klepper & Sally Sleeper, *Entry by Spinoffs*, 51 MGMT. SCI. 1291, 1292–93 (2005) (asserting that diffusion of knowledge plays a key role in the success of spinoffs).

397. See Gordon Moore & Kevin Davis, *Learning the Silicon Valley Way*, in BUILDING HIGH-TECH CLUSTERS 7, 31–35 (Timothy Bresnahan & Alfonso Gambardella eds., 2004) (discussing the importance of spinoffs and start-ups to the economic growth of Silicon Valley).

employees from the inventive activities in which they are most experienced. To smaller and newer firms however, these divisions, which are greatly inefficient in any firm, are impossible. Larger companies with sufficient legal and financial resources can aggressively drive out competition even when their legal claims rest on weak grounds.³⁹⁸ Litigation is strategic when it is motivated by and thrives from the uncertainty of claims, high cost of litigation, and asymmetry in the stakes faced by the company and the former employees.³⁹⁹ Even when claims cannot be substantiated, small companies can be driven out of markets.⁴⁰⁰ In general, litigation over IP and human capital, even in the absence of structural penalties on target defendants, has the power to create sufficient uncertainty to kill a venture.⁴⁰¹ Thus, under the new cognitive property, employees who face a choice whether to leave to form a new company or to join an established company are likely to consider the potential costs of legal liabilities and decide against entrepreneurship.⁴⁰²

The new cognitive property thus advantages firms with superior resources. Asymmetrical litigiousness directed at employees who wish to leave an employer operates similarly to noncompetes. Human capital law—with the rise in noncompetes, expansion of the type of confidential information as protected trade secrets, expansion of innovation pre-assignment, and its aggressive enforcement—has traditionally striven to protect freedom of contract and to encourage businesses' initial incentives to invest in innovation.⁴⁰³ New research challenges us to rethink our approach to these regimes. The evidence is nearly universal. Overall, excessive controls over mobility and inventiveness are harmful to careers, regions, and innovation. The harm is not simply caused by the aggregate reduction in mobility, knowledge flow, and network richness but is also created by the

398. See generally Patrick Bolton & David S. Scharfstein, *A Theory of Predation Based on Agency Problems in Financial Contracting*, 80 AM. ECON. REV. 93 (1990) (discussing deep-pocket predation, by which wealthy firms drive their less wealthy competitors out of business by reducing competitors' cash flows).

399. As such, litigation by companies against their former employees has similar characteristics to trolling in patent and copyright litigation. See Mark A. Lemley & A. Douglas Melamed, *Missing the Forest for the Trolls*, 113 COLUM. L. REV. 2117, 2122 (2013) (describing patent predation cases, in which large firms use patent litigation to stamp out a smaller competitor).

400. See Agarwal et al., *supra* note 386, at 1367 (determining that aggressive patent litigation by established firms may intimidate other businesses from attempting to enter that firm's market, particularly entrepreneurial firms); Jamal Shamsie, *The Context of Dominance: An Industry-Driven Framework for Exploiting Reputation*, 24 STRATEGIC MGMT. J. 199, 209 (2003) (suggesting that a large firm's ability to exploit any competitive advantage it gains from its reputation is a key indicator of that firm's continued dominance over its industry).

401. Alexander E. Silverman, Symposium Report, *Intellectual Property Law and the Venture Capital Process*, 5 HIGH TECH. L.J. 157, 159–60 (1989) (explaining how established tech firms can use the threat of IP litigation to cripple or destroy start-up tech firms).

402. See Larson, *supra* note 386, at 14 (explaining that lawsuits against start-ups can “scare off new recruits”).

403. See Lobel, *supra* note 95, at 519 tbl.18.1 (asserting that the primary motivation behind the growth of all three of these areas of human capital controls rests on protecting employers' investments).

motivational and behavioral aspects of creative individuals as they interact with their environment. In particular, it stymies the entry of new competitors into the market and suppresses the spirit of entrepreneurship, which is vital to any economy.

Conclusion

Contemporary human capital law is a mongrel, amoebic creature that has grown under the radar for too long. Through doctrine and contract, the rise of the new cognitive property removes not only the outputs of innovation but also its inputs—including skills, experience, tacit knowledge, professional relationships, motivation, and innovative potential—from the public domain. The heightened significance of human capital as a highly valuable resource along with dramatic changes in labor markets has effectuated record numbers of disputes and conflicts. This Article has argued that the rise of cognitive property creates too many walls that enclose vital knowledge and creative potential. In the twenty-first century, human capital law has thus become one of our most acute collective challenges. Restrictions on the flow of knowledge—through noncompetes, nondealings agreements, trailer clauses, and pre-innovation clauses—contaminate market flows and diminish both the incentives to move efficiently in the market and the incentives to innovate. For knowledge to flow, for networks to remain dense, for motivation to keep innovation high, and for new blood to disrupt stagnated paths, the law must upend the rapid rise of the new cognitive property and restore the balance between protected forms of information and a vital public domain.