SIMILAR SECRETS

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ABSTRACT. A foundational question in every dispute over intellectual property is whether the defendant's product is too similar to the plaintiff's. For almost all intellectual property regimes, an extensive body of case law and academic commentary has examined how such similarity should be measured. Trade secrecy, however, remains a remarkable exception. In trade secrecy cases, just as in other intellectual property cases, the defendant's good or method can diverge markedly from what the plaintiff developed. Yet it turns out that trade secret case law provides little guidance for assessing how much similarity is too much. The standard remains, fittingly but frustratingly, a secret.

This Article takes the first close look at what that standard should be. We argue that trade secrecy's similarity framework is currently asking an incomplete set of questions. It inquires almost exclusively into the defendant's innovation process, instructing fact-finders to determine whether the defendant had acquired any advantage from familiarity with the secret. In doing so, it wrongly skips over an inquiry into the end product or method that the defendant is actually exploiting. A better test would consider not only the defendant's benefit from knowing the secret, but also the kind of good that the benefit ultimately translates into. Under our proposal, claims for misappropriation through either improper acquisition or disclosure would remain largely the same. But misappropriation through use would change. A defendant wouldn't be liable for using a lawfully acquired secret unless it is exploiting a good that incorporates material elements from the owner's secret in a manner that the plaintiff actually foresaw or, given industry trends, could reasonably have foreseen.

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INTRODUCTION

> Outright and forthright duplication is a dull and very rare type of infringement.
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> —Graver Tank & Mfg. Co. v. Linde Air Prods. Co. [1]

Liability for appropriating intellectual property (IP) usually does not require identical copies. All it takes is a sufficient degree of similarity between the plaintiff's and defendant's products. One of IP policy's core questions is figuring out where to draw that line of sufficiency.[2] How similar, in other words, is too similar?

For almost all IP regimes, an extensive body of case law has attempted answers, and an equally extensive volume of academic commentary has offered critiques.[3] Yet there remains a remarkable exception: trade secrecy. In trade secrecy cases, just as in other IP cases, a defendant's protected information (be it software code, a chemical formula, or a manufacturing process) can diverge from the one that the plaintiff developed. Often, a plaintiff's employee or business associate acquired that information perfectly lawfully but then left to start a different venture, modifying it into something new. Adaptation seems to occur at least as often as verbatim duplication. Indeed, a leading treatise in this area notes that "most appropriation consists of some rather indirect exploitation of the owner's information" rather than a mere slavish copy-and-paste.[4]

Given such exploitation's frequency, courts should know how to think about it. Our claim in this Article is that they don't. In theory, some derivative uses are supposed to lie beyond the trade secret owner's control. Courts like to repeat the maxim that only those uses that qualify as "substantial" constitute actionable misappropria-

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1. 339 U.S. 605, 607 (1950).

2. *See, e.g.*, Jeanne C. Fromer & Mark A. Lemley, *The Audience in Intellectual Property Infringement*, 112 Mich. L. Rev. 1251, 1252 (2014) ("A principal question in IP infringement disputes is whether the defendant's product (or work, or brand, or idea) is too similar in some respect to the plaintiff's.").

3. *See, e.g.*, Barton Beebe, *An Empirical Study of the Multifactor Tests for Trademark Infringement*, 94 Calif. L. Rev. 1581 (2006) (trademark); Fromer & Lemley, *supra* note 2 (copyright, patent, and trademark); Mark A. Lemley, *The Economics of Improvement in Intellectual Property Law*, 75 Tex. L. Rev. 989 (1997) (patent and copyright); Pamela Samuelson, A *Fresh Look at Tests for Nonliteral Copyright Infringement*, 107 Nw. U. L. Rev. 1821 (2013) (copyright).

4. James Pooley, Trade Secrets § 6.03[3] at 6-30 (2017). It further notes that Justice Jackson's observation on the dullness of patent infringement through outright duplication, quoted in this Article's epigraph, "applies equally to trade secrets." *Id.*

tion.[5] But no one really seems to know what that term means. Without ever acknowledging it, courts have veered between cursory analogies to copyright law on the one hand and to patent law on the other. This doctrinal scavenging obscures more than it clarifies. The standard for actionable similarity in trade secrecy cases remains, fittingly but frustratingly, a secret.

Unfortunately, the upshot in many decisions is that essentially *any* use counts as substantial. The case law seldom investigates whether the copied information was a significant part of the plaintiff's entitlement or whether the defendant's use poses any threat of market harm. Instead, the test quickly collapses into a binary question of whether exposure to the secret educated the defendant at all, regardless of what the defendant's final product ends up looking like.[6]

That test is hopelessly overbroad. To begin with, in cases where the defendant acquired the information lawfully rather than through a wrongful act, it seems to give a windfall to owners. IP policy generally tries to avoid restrictions on downstream use that don't confer offsetting benefits to society. But such restrictions are especially pernicious in trade secrecy. In other areas of IP like copyright and patent, second comers can usually design around an upstream owner's entitlement by turning to a substitute.[7] A filmmaker unable to license a song can use a different song; a smartphone producer unable to license a chip can use a different chip. But under courts' current approach to similarity in trade secrecy, it's virtually impossible for a departing em-

5. *See* Restatement (Third) of Unfair Competition § 40 cmt. c (1995) [hereinafter Restatement (Third)] (observing that while "improvements or modifications" to a trade secret can qualify as actionable misappropriation "if the result is substantially derived from the trade secret," an actor is not liable "if the contribution made by the trade secret is so slight that the actor's product or process can be said to derive from other sources of information or from independent creation").

6. *See id.*, reporter's note ("Even if the defendant's final product or process differs significantly from that of the plaintiff, substantial use of the trade secret in the course of the defendant's research can be sufficient to constitute an appropriation.").

7. The major IP subfield missing from our discussion is trademark law. We don't focus on it because, unlike the other regimes that center on promoting innovation and creativity, trademarks' traditional purpose is reducing consumer confusion. *See, e.g.*, TrafFix Devices, Inc. v. Marketing Displays, Inc., 532 US 23, 34 (2001); Christian Louboutin S.A. v. Yves Saint Laurent Am. Holdings, Inc., 696 F.3d 206, 224 n.20 (2d Cir. 2012); Laura A. Heymann, *The Trademark/Copyright Divide*, 60 S.M.U. L. Rev. 55, 65 (2007) ("Unlike copyright and patent law, trademark law is not designed to offer the trademark holder incentives to create . . . . Rather, trademark law is typically justified in terms of . . . protecting consumers from deception in the marketplace by prohibiting the use of source-identifying marks if such use is likely to confuse consumers as to the source of the product.").

ployee to find a substitute. You can't erase a secret once you know it. If that secret would provide a boost in the R&D process—even one that leads to a good or method radically different than the one embodying the plaintiff's secret—the employee's best alternative isn't a substitute component but to abandon the line of research altogether. As one judge recently quipped in a headline-grabbing lawsuit between Uber and Google-spinoff Waymo over driverless car technology, "Is an engineer supposed to get a frontal lobotomy before they go on to the next job?"[8]

The inattention to a similarity standard is all the more surprising given trade secrecy's exponentially increasing stakes. Trade secrecy was once a decentralized product of individual states' common law. It's now a major IP scheme. Almost all states have implemented a version of the Uniform Trade Secrets Act (UTSA),[9] and as of Congress's enactment of the Defend Trade Secrets Act of 2016 (DTSA), plaintiffs can pursue a claim under federal law as well.[10] The DTSA's passage has been called "the most significant expansion of federal law in intellectual property" since the 1940s.[11] The executive branch, for its part, has also been ramping up enforcement of criminal laws against misappropriation, from a few cases a year in the late 1990s to hundreds over the last decade.[12]

Trade secrecy law's growing supply meets an equally growing demand. One 2014 study, cited in the Senate Report accompanying the DTSA, pegged the current cost of trade secret misappropriation at somewhere between one and three percent of the U.S. gross domestic product.[13] Even before the DTSA's enactment, trade secret litiga-

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8. Orly Lobel, *NDAs Are Out of Control. Here's What Needs to Change*, Harvard Bus. Rev., Jan. 30, 2018 (quoting Judge Alsup's colloquy with the parties). The case settled in the middle of trial. Russ Mitchell, *Uber Reaches Settlement with Waymo in Dispute over Theft of Trade Secrets*, L.A. Times (Feb. 9, 2018, 8:30 am), http://www.latimes.com/business/autos/la-fi-uber-waymo-settlement-20180209-story.html.

9. Unif. Trade Secrets Act (1985) [hereinafter UTSA].

10. *See* Defend Trade Secrets Act of 2016, Pub. L. No. 114-153, 130 Stat. 376 (2016). The DTSA amends the Economic Espionage Act of 1996 to provide a federal cause of action for trade secret misappropriation. 18 U.S.C. § 1836(b). Prior to the DTSA, civil trade secret claims were the exclusive province of state laws, while federal law provided only criminal penalties.

11. Eric Goldman et al., Professors' Letter in Opposition to the Defend Trade Secrets Act of 2015 (S. 1890, H.R. 3326), (Nov. 17, 2015), *available at* https://cyberlaw.stanford.edu/files/blogs/2015%20Professors%20Letter%20in%20Opposition%20to%20DTSA%20FINAL.pdf.

12. *See* Orly Lobel, *The DTSA and the New Secrecy Ecology*, 1 Bus., Entrepreneurship, & Tax L. Rev. 369, 372–73 (2018).

13. The Center for Responsible Enterprise and Trade & PricewaterhouseCoopers LLP,

tion had been growing rapidly in both state and federal court.[14] A recent analysis found that between 2001 and 2012, the number of trade secret cases adjudicated in federal court grew fourteen percent each year.[15] Consistent with these litigation rates, survey evidence confirms that trade secrecy is an enormously popular form of intellectual property protection among firms.[16] Trade secrets, unlike patents, arise by operation of law and are therefore cheap to acquire, without any government examination necessary. And so long as they remain undisclosed, they can last forever.[17]

Part of the story behind trade secrecy's rise may be a declining value in patent protection for certain inventions. Historically, whenever a particular invention has been eligible for a patent, firms have strategized whether a patent or a trade secret would best allow it to capture the invention's value. Following a series of recent Supreme Court decisions, patent-eligible subject matter has narrowed considerably, particularly for software and business methods.[18] According to some, that narrowing has been nudging firms out of the patent system and toward secrecy.[19]

The Economic Impact of Trade Secret Theft 9 (2014) (cited in S. Rep. No. 114-220, at 2 (2016)).

14. David S. Almeling et al., *A Statistical Analysis of Trade Secret Litigation in Federal Courts*, 45 Gonz. L. Rev. 291, 293, 301–02 (2010) (finding that trade secret litigaiton in federal court had doubled every decade over the prior 30 years even as federal litigation overall had decreased); David S. Almeling et al., *A Statistical Analysis of Trade Secret Litigation in State Courts*, 46 Gonz. L. Rev. 57, 67–68 (2011) (finding that trade secret litigation was increasing at a rate faster than that of state litigation overall).

15. John E. Elmore, *A Quantitative Analysis of Damages in Trade Secrets Litigation*, Insights, Spring 2016, at 79, 85.

16. *See* John E. Jankowski, Business Use of Intellectual Property Protection Documented in NSF Survey, Nat'l Sci. Found. (Feb. 2012), http://www.nsf.gov/statistics/infbrief/nsf12307/nsf12307.pdf (reporting survey results finding that "a diverse group of industries reported trade secrets as very or somewhat important to their businesses" more so than they did any other form of intellectual property).

17. The formula for Coca-Cola is probably the most famous example. *See* Coca-Cola Bottling Co. of Shreveport, Inc. v. Coca-Cola Co., 107 F.R.D. 288, 294 (D. Del. 1985). But it's not the oldest. *See* Andrew A. Schwartz, *The Corporate Prefrence for Trade Secret*, 74 Ohio St. L.J. 623, 651 (2013) (discussing the secret formula of metal alloys used in drum cymbals that Avedis Zildjian invented in 1623 Constantinople, now property of the Massachusetts-based Avedis Zildjian Company, Inc.)

18. *See* Alice Corp. Pty. Ltd. v. CLS Bank Int'l., 134 S. Ct. 2347 (2014); Mayo Collaborative v. Prometheus Labs., 566 U.S. 10 (2012); Bilski v. Kappos, 561 U.S. 593 (2010).

19. *See, e.g.*, Lobel, *supra* note 12, at 376 ("Both the strengthening of trade secret law and the uncertainty about patent eligibility of certain biotechnologies, business processes, and software inventions may lead today's firms to rely more heavily on trade secret laws."); Jeffrey Mordaunt and Joshua Swedlow, *Why*

Whatever the reason, trade secrets are everywhere—and growing.[20] As this body of law continues ascending within firms' IP strategies as well as courts' dockets, its doctrine must figure out what to do in the ubiquitous scenario where a defendant's product isn't exactly like the plaintiff's. As a matter of innovation policy, an employee or business partner who comes into contact with a trade secret and then ceases to work with its owner needs to know how to continue researching the same problem without incurring liability. The answer cannot be, as it de facto too often is, that these individuals must simply find different problems to work on. A competing firm could try to deal with the issue by setting up a so-called "clean room," walling itself off from the individual who knows the secret. But much of the time, that solution would perversely prevent experts from working on the precise line of research they know best.

There is a better way. Trade secrecy's similarity doctrine is currently asking an incomplete set of questions. It inquires almost exclusively into the defendant's innovation *process*, instructing factfinders to determine whether the defendant has acquired any useful knowledge from familiarity with the secret. It wrongly skips over an inquiry into the defendant's *product*.[21] A more sensible test would consider not only the defendant's benefit from knowing the secret, but also the kind of product that the benefit ultimately translates into.

This Article proposes that, while the standard for misappropriation through either improper acquisition or disclosure would remain largely the same, the standard

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Trade Secret Litigation Is On The Rise, Law360 (Nov. 14, 2017, 12:16 pm), https://www.law360.com/articles/983195/why-trade-secret-litigation-is-on-the-rise (concluding that given the current rates of patent invalidation, "interested stakeholders have justifiable concerns regarding the future value of patents involving software and life sciences"); Douglas R. Nemec et al., *The Rise of Trade Secret Litigation in the Digital Age*, Skadden's 2018 Insights (Jan. 23, 2018), https://www.skadden.com/insights/publications/2018/01/2018-insights/the-rise-of-trade-secret-litigation (arguing that, following the Supreme Court's recent patentable subject matter decisions, "many companies have lost confidence in the ability to protect their technology with patents and are instead turning to trade secrets.").

20. *See, e.g.*, Peter S. Menell, *Tailoring a Public Policy Exception to Trade Secret Protection*, 105 Calif. L. Rev. 1, 3 (2017) (dubbing trade secrets "the most pervasive form of intellectual property in the modern economy").

21. Throughout, we use the term "product" to mean the result of the owner's investment in development. It's the thing in which the IP entitlement is embodied, whether that thing is an object (like a chemical) or an activity (like a manufacturing technique). A downside of our usage, we confess, is that it cumbersomely refers to the activities as products, even if they might be called processes in other contexts. When we speak of a trade secret owner's "process," we mean something else: the series of R&D steps that leads up to a product's completion.

for misappropriation through *use* should change. A defendant wouldn't be liable for using a lawfully acquired secret unless it is both exploiting a good that incorporates material elements from the owner's secret and is doing so in a market that the plaintiff actually foresaw or, given industry trends, could reasonably have foreseen.[22] Merely relying on a secret as a launching pad for developing a genuinely dissimilar good, or operating in a remote and unanticipatable market, would remain permissible.[23] Under that standard, owners would still remain adequately insulated against competition in their core markets. Downstream users, meanwhile, would gain some additional freedom to pursue cumulative innovation. Employees who know secret information but wish to build upon it would not be tethered to that same employer.

We begin in Part I of this Article by surveying how trade secrecy handles inexact similarity. Perhaps reflecting the lack of any framework internal to trade secret doctrine itself, courts sometimes look to a different branch of IP for guidance on assessing similarity. When they do, patent law is the usual reference point. But a patent's scope is defined ex ante by written claims, and its nonliteral similarity test is keyed to the words in those claims. A trade secret's scope, by contrast, is never truly defined until a misappropriation allegation is actually adjudicated in court. As a result, those cases that purport to be analogizing to patent doctrine end up assessing holistically what a patent case would dissect into individual elements. If they are channeling patent law, they are doing so only at a dizzyingly high level of generality: the unhelpful proposition that misappropriation does not require an absolute identity between plaintiff's and defendant's products. The analogy does little analytical work toward specifying what level of similarity misappropriation actually does require. A few trade secret cases gesture instead toward copyright law, but they, too, get no further than the starting point that actionable copying need not be verbatim.

If courts pursuing these cross-regime comparisons dug a bit deeper, they would discover that trade secrecy currently gives owners much greater control over adaptive uses than do patents or copyrights. As we argue in Part II, that inflated level of con-

22. As we stress in Part III, however, an adapter might still be liable if he initially acquires the secret through improper means. We propose only that the notion of "use" exclude unforeseeable adaptations, not that adapters should receive a safe harbor that shields them retroactively from liability for improper acquisition.

23. We do not deal here with the separate, though related, issue of a defendant's substantial improvement to a plaintiff's secret technology. Such improvements could be dealt with if trade secrecy had a fair use doctrine, which it currently does not. Perhaps it should. *See generally* Deepa Varadarajan, *Trade Secret Fair Use*, 83 Fordham L. Rev. 1401, 1408 (2014).

trol is neither necessary to protect owners' investments nor healthy for innovation. As a result, we propose three changes that courts should make to existing misappropriation doctrine. First, when fact finders ask whether the defendant is "using" the secret, they should focus on the end product that the trade secret defendant is commercially exploiting, rather than the defendants' earlier R&D steps along the way. A defendant who comes up with a radically different good after having been lawfully exposed to the plaintiff's secret shouldn't be treated the same as one who is engaged in outright duplication. Second, a defendant shouldn't be liable for using information unless it materially contibuted to the protectability of the trade secret in the first place. Third, only reasonably foreseeable uses of the plaintiff's secret should be actionable. Unforeseeable ones, which the plaintiff did not and could not reasonably have predicted at the time it decided to invest in developing the secret, should be permitted.

Applying this standard would affect some categories of trade secrets more than others. Business information like customer lists and pricing data, which tend to be used in specific and foreseeable ways, would likely receive the same protection it enjoys under current law. Technological information with recognizably wide applicability would as well. Research tools, for example, would be protected against unauthorized use for their intended commercial purpose—experimentation—regardless of what fruits a particular experiment happened to bear.[24] But technological information with seemingly limited applications, like a particular chemical formula, would receive narrower coverage if an unexpected market later arises. This category of information would continue to receive protection in the markets that had incentivized the owner's investment—just not the ones that hadn't. As a general matter, the more potential commercial uses a secret has at the outset, the wider the protection it receives against another's use.

Of course, our proposal would make trade secret protection somewhat less attractive to firms. But as more discoveries that might once have been patented now remain secret, it may not be such a bad thing to coax some firms back into disclosing their useful inventions to society.[25]

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24. *Cf.* Katherine J. Strandburg, *What Does the Public Get? Experimental Use and the Patent Bargain*, 2004 Wis. L. Rev. 81, 121–22 (distinguishing between "experimenting on" a typical patented invention and "experimenting with" a research tool, and concluding that "unauthorized use of a research tool has a direct impact on the market for the tool" in a way that tinkering with a garden-variety invention does not).

25. *See* Kewanee Oil Co. v. Bicron Corp., 416 U.S. 470, 494 (1974) (Marshall, J., concurring) (observing

To trade-secret practitioners, this package of interventions might sound radical. As Part II shows, however, copyright law offers some decent proof of concept for how our proposed similarity framework could be structured. Copyright infringement analysis breaks the concept of copying down into two halves, one factual and one normative. Even if a defendant did copy something from the plaintiff as a matter of historical fact, the plaintiff must also show that the copied portion was substantial enough to justify liability as a matter of normative judgment.

As part of that second, normative inquiry, courts routinely disregard a defendant's preliminary and otherwise-infringing draft if the final product released to market turns out to be noninfringing. In doing so, they effectively ignore a copy so long as it never attains independent economic significance and therefore poses no threat to the owner's legitimate markets—even if, as is often the case, that copy helps a second comer learn more about the field.

In addition, copyright's infringement framework encompasses not just similarity between the works themselves but also between their commercial uses. Through its fair use doctrine, copyright law frequently discounts a defendant's exploitation if it was in a genuinely unforeseeable market. While the cases don't make this doctrinal move as consistently as they do the other two, defendants on average have a stronger argument against liability if they are operating in a market that was not reasonably predictable within the plaintiff's industry. When properly invoked, this limitation allows second comers to exploit remote opportunities that the owner would not have envisioned.

Finally, Part III sketches out some possible ways to implement our recommendations. We think that the best place to reform substantial derivation doctrine is within the underlying definition of liability. Under our primary proposal, a plaintiff would need to prove a material and foreseeable use as part of its case-in-chief. There are, however, other ways to increase judicial tolerance for these uses without tinkering with the elements of the plaintiff's case. Courts could instead conduct these inquiries as part of an affirmative defense or while calculating remedies after liability has been established. We present the pros and cons of each alternative. Whichever approach one favors, however, we emphasize that the ball is in courts' hands. For any of them, no statutory change would be necessary.

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that "trade secret protection provides in some instances a substantial disincentive to entrance into the patent system," which "deprives society of the benefits of public disclosure of the invention which it is the policy of the patent laws to encourage").

I. SIMILARITY IN TRADE SECRECY

When it comes to similarity standards, there are scholarly cottage industries devoted to copyright's pathologies on the one hand and patent law's on the other. So as we add trade secrecy to the mix, it may seem strange to study those two very regimes in search of insights. Nevertheless, there are a few good reasons to juxtapose the three together.

First and fundamentally, they are each on some level trying to accomplish the same thing: encouraging investment in developing informational goods that would be undersupplied without some exclusivity mechanism to ward off imitators who wouldn't bear the originator's fixed costs.[26] To be sure, policymakers should also look beyond IP's borders; the common law of property, tort, and contract can provide guidance, too.[27] But given the idiosyncratic difficulties of delineating rights in intangible information that is abstract and in some way new, other IP regimes can be especially fruitful areas to consult.[28]

Here, we should pause to lay our first-principle cards on the table: we start from the utilitarian premise that trade secret protection's primary justification is to encourage the production and (limited) sharing of socially valuable information. The Supreme Court has endorsed that justification,[29] and many commentators today

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26. *See* Varadarajan, *supra* note 23, at 1408 ("[Trade secrecy] is increasingly theorized as a subset of intellectual property because it shares the incentive-promoting goals of patent and copyright. Courts and scholars often justify patent, copyright, and trade secret laws as mechanisms to encourage the invention or creation of new technological advances and expressive works."); *cf.* Jeanne C. Fromer, *A Psychology of Intellectual Property*, 104 Nw. U. L. Rev. 1441, 1442–43 (2010) ("Using the same theoretical approach to explain or challenge [copyright's and patent's] dissimilarities indicates that, at their foundation, patent and copyright law have more in common than legal scholarship often appreciates . . . .").

27. Indeed, we draw an analogy to tort-law foreseeability principles below. *See infra* section II.C.1. For more extended discussions of how common-law doctrines should influence IP law, see for example Shyamkrishna Balganesh, *Copyright and Good Faith Purchasers*, 104 Calif. L. Rev. 269 (2016); Dmitry Karshtedt, *Causal Responsibility and Patent Infringement*, 70 Vand. L. Rev. 565 (2017); Henry E. Smith, *Intellectual Property as Property: Delineating Entitlements in Information*, 116 Yale L.J. 1742 (2007); Deepa Varadarajan, *Improvement Doctrines*, 21 George Mason L. Rev. 657 (2014).

28. *See* Jeanne C. Fromer, *Claiming Intellectual Property*, 76 U. Chi. L. Rev. 719, 726 (2009).

29. *See* Kewanee Oil Co. v. Bicron Corp., 416 U.S. 470, 484–85 (1974) ("Trade secret law will encourage invention in areas where patent law does not reach and will prompt the independent innovator to proceed with discovery and exploitation of his invention."); *id.* at 486 (observing that, absent trade

build on that bedrock.[30] By giving the information's developer the right to control other's usage, trade secrecy can stimulate investment that might not have been made without the possibility of supracompetitive profits. And by lowering the likelihood of ruinous public disclosure, it can reduce reliance on wasteful self-help to preserve secrecy and encourage the efficient sharing of information within the firm or between business partners. This rationale is not the only one available, however. Many courts have invoked a different theory in which the duty not to misappropriate helps maintain an industry's standards of commercial ethics.[31] Other commentators have criticized that theory, and we don't intend to litigate its merits here.[32] If you're a proponent of it, though, you should know now that this Article doesn't address it further.

Second, as this Part surveys, some judges are already invoking patent and, to a lesser degree, copyright law in working through trade secrecy's similarity standard.[33] Lining up trade secrecy's treatment of copyright and patent doctrines next to those

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secret protection, "[t]he holder of a trade secret would . . . hoard rather than disseminate knowledge" and "[i]nstead of licensing others to use his invention and making the most efficient use of existing manufacturing and marketing structures within the industry, the trade secret holder would . . . limit his utilization of the invention, thereby depriving the public of the maximum benefit of its use); *see also, e.g.*, American Can Co. v. Mansukhani, 742 F.2d 314, 329 (7th Cir. 1984) ("The primary purpose of trade secret law is to encourage innovation and development"); Roger M. Milgrim, 1 Milgrim on Trade Secrets 73–98 (2006) (listing cases describing trade secrets as property and intellectual property).

30. *See, e.g.*, David D. Friedman et al., *Some Economics of Trade Secret Law*, 5 J. Econ. Perspectives 61, 64 (1991) (contending that trade secrecy "supplements the patent system" and is "congruent with the basic economic explanation for patent protection—that it provides a means of internalizing the benefits of innovation"); Mark A. Lemley, *The Surprising Virtues of Treating Trade Secrets as IP Rights,* 61 Stan. L. Rev. 311, 329 (2008) (arguing that trade secrets should be understood as IP rights because they share "two critical features . . . with other IP rights—they promote inventive activity and they promote disclosure of those inventions."); *but cf.* Robert G. Bone, *The (Still) Shaky Foundations of Trade Secret Law*, 92 Tex. L. Rev. 1803, 1807-08 (expressing skepticism that "trade secret law generates incentive benefits that exceed its costs").

31. *See, e.g.*, E.I. du Pont de Nemours & Co. v. Christopher, 431 F.2d 1012, 1016 (5th Cir. 1970); Jet Spray Cooler, Inc. v. Crampton, 385 N.E.2d 1349, 1354–55 (Mass. 1979); Restatement of Torts § 757 cmt. f at 10 (1939) (defining wrongful acquisition as through means "which fall below the generally accepted standards of commercial morality and reasonable conduct"). Even the Supreme Court in *Kewanee*, in the midst of its exposition on trade secrecy's role in promoting innovation, noted that "[t]he maintenance of standards of commercial ethics" is an additional "polic[y] behind trade secret law." 416 U.S. at 481.

32. For skeptical takes, see Lemley, *supra* note 30, at 327–28, and Bone, *supra* note 30, at 1810.

33. *See infra* sections II.B–C.

same doctrines in their native habitats reveals the strengths and weaknesses of these judicial analogies. Finally, however imperfect these other regimes may be, judges have been refining their contours since the start of the Republic—considerably longer than trade secrecy has existed as a formal body of law. Warts and all, copyright and patent may have valuable lessons to offer the relative newcomer.

This Part begins in section A with a brief overview of a few basic points of trade secret law. Section B turns to the doctrine of substantial derivation, trade secrecy's mechanism for analyzing inexact adaptations of protected information. Section C highlights the substantial derivation cases that purport to be analogizing to corresponding doctrines in patent law, yet don't seem to be doing a very good job. Finally, Section D does the same for cases analogizing to copyright.

A. Background

Trade secret law protects valuable information that companies try to keep secret, including both technological inventions like chemical formulas and business information like pricing data.[34] While state trade secret laws vary at the margins, almost every state has enacted a version of the UTSA.[35] In 2016, Congress passed the DTSA, introducing a new federal civil claim for trade secret misappropriation that largely mirrors the UTSA.[36]

Trade secrecy has a different origin story than patent and copyright law. Rather than beginning with the First Congress exercising its powers under the Constitution's IP Clause,[37] trade secret protection grew out of nineteenth-century common law and

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34. *See* Robert P. Merges et al., I Intellectual Property in the New Technological Age 36 (2018 ed.).

35. The UTSA, a model state statute, was issued by the National Conference of Commissioners on Uniform State Laws in 1979. As of this writing, all states have adopted the UTSA except for New York and North Carolina. *See* Trade Secrets Act, Uniform L. Commission, http://www.uniformlaws.org/Act.aspx?titletrade+Secrets+Act. More recently, the 1995 Restatement (Third) of Unfair Competition describes the principles of trade secret law, which are largely consistent with the UTSA. *See* Restatement (Third), *supra* note 5, §§ 39–45. Courts have not, however, accepted it widely. *See* James Pooley, *The Myth of The Trade Secret Troll: Why the Defend Trade Secrets Act Improves the Protection of Commercial Information*, 23 Geo. Mason L. Rev. 1045, 1051 (2016).

36. For a discussion of the similarities and differences between the DTSA and UTSA, see Sharon K. Sandeen & Christopher Seaman, *Toward a Federal Jurisprudence of Trade Secret Law*, 32 Berkeley Tech. L.J. 829 (2017); Lobel, *supra* note 12, at 372–73.

37. *See* U.S. Const. art. 1, § 8, cl. 8 (providing that Congress shall have the power "to promote the Progress

unfair competition principles.[38] Despite the different provenance, however, most contemporary commentators have come to view trade secrets as a subset of IP, a tool to promote innovation and information-sharing similar to patents and copyrights.[39] To acquire protection, a company possessing an eligible secret does not need to apply to any government agency or define ex ante the boundaries of their entitlements. The legal right simply springs into being by operation of law. As a result, tricky issues of trade secret validity and scope are left to be worked out through litigation.

To qualify for protection, information must meet several criteria.[40] First, it must have "independent economic value, actual or potential." Second, it cannot be "generally known" or "readily ascertainable" by others in the field, meaning that firms may not claim any exclusivity over published or well-known industry data. Third, even if those criteria are satisfied, the owner must continuously engage in reasonable measures to keep the information secret.[41] While a trade secret has no fixed term, protection expires as a practical matter once the secret gets out.[42]

To succeed on a trade secret claim, a plaintiff must show not only that a valid trade secret exists but also that the defendant misappropriated it.[43] Misappropriation can occur in a few ways. The first is wrongful acquisition. One may not learn a secret using "improper means," a nebulous category that includes not only acts that are independently unlawful (think wiretapping or trespassing), but also those that fall below "generally-accepted standards of commercial morality and reasonable conduct."[44]

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of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries").

38. *See, e.g.*, James Pooley, *The Myth of The Trade Secret Troll, Why the Defend Trade Secrets Act Improves the Protection of Commercial Information,* 23 Geo. Mason L. Rev. 1045, 1048 (2016). For a detailed history of the evolution of trade secret law in the United States, see generally Sharon Sandeen, *The Evolution of Trade Secret Law and Why Courts Commit Error When They Do Not Follow the Uniform Trade Secrets Act,* 33 Hamline L. Rev. 493 (2010).

39. *See supra* text accompanying note 30.

40. These criteria are laid out similarly in UTSA § 1(4) and 18 U.S.C. § 1839(3).

41. Reasonable secrecy efforts can take different forms in different contexts, including both physical and contractual means. For a discussion of this requirement and the reasons behind it, see generally Deepa Varadarajan, *Trade Secret Precautions, Possession, and Notice,* 68 Hastings L.J. 357 (2017).

42. *See, e.g.,* Merges et al., *supra* note 34, at 58; Milgrim, *supra* note 29, § 1.05.

43. *See* UTSA § 1(2); 18 U.S.C. § 1839.

44. E.I. DuPont de Nemours & Co. v. Christopher, 431 F.2d 1012 (5th Cir. 1970) (quoting Restatement of Torts § 757 cmt. f at 10 (1939)). *Christopher*, likely the most famous improper

These improper means cases typically involve individuals with no prior relationship to the plaintiff, potentially competitors, engaged in some form of competitive intelligence.[45]

A second and more common flavor of misappropriation is using or disclosing the secret in violation of a confidentiality duty. The vast majority of trade secret cases under state law involve departing employees accused of breaching express confidentiality duties in nondisclosure agreements.[46] Other business associates, such as joint-venture collaborators, suppliers, and distributors, may also be subject to express or implied confidentiality duties.[47] Early returns show this trend continuing under the DTSA, with two-thirds of all cases filed in the law's first year involving a current or former employee, a quarter involving a current or former business partner, and only a tenth involving parties without any prior relationship.[48] Finally, third parties can commit misappropriation by using or disclosing the secret if they "knew or had reason to know" that the information had previously been obtained through improper means or in violation of a confidentiality duty.[49]

Each of these acts is an independent basis for liability. A defendant who acquires a secret improperly has committed misappropriation, even without any subsequent disclosure or use. Likewise, a defendant who uses or discloses the secret in violation of a confidentiality duty has committed misappropriation, even if the initial acquisition of that secret was entirely proper (as is often the case with former employees or business associates).[50] Despite this conceptual distinction between acquisition, disclosure and use, plaintiffs may allege multiple theories, and courts sometimes blur the distinctions between them.[51]

Out of these various forms of misappropriation, disputes over adaptations of

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means case, involved aerial spying.

45. *See* Lemley, *supra* note 34, at 318.

46. *See, e.g.,* Ameling et al., *supra* note 14, at 69 (finding that in 77% of state appellate decisions between 1995 and 2009, the alleged misappropriator was an employee or former employee).

47. *See, e.g., id.* at 68–69; Merges et al., *supra* note 34, at 83.

48. David S. Levine & Christopher B. Seaman, *The DTSA At One: An Empirical Study of the First Year of Litigation Under the Defend Trade Secrets Act*, 53 Wake Forest L. Rev. __ (forthcoming 2018) (draft at 32), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3112679.

49. UTSA § 1(2); 18 U.S.C. § 1839.

50. *See, e.g.,* GlobeSpan, Inc. v. O'Neill, 151 F. Supp. 2d 1229, 1235 (C.D. Cal. 2001).

51. *See infra* Part III.

trade secrets will most likely implicate the meaning of unauthorized "use."[52] A defendant who improperly acquired the secret in the first instance would, after all, already be liable; downstream adaptation would be beside the point. In the typical scenario, an individual defendant was once associated with the trade secret owner before leaving to join a competitor or start a competing business himself. That business then either exploits a product or method that is different from—but arguably similar enough to—the trade secret. The owner then sues the individual (and sometimes the new employer) for using the secret without permission. The following sections walk through how courts have analyzed these cases.

B. Substantial Derivation

As in other areas of IP, actionable use in trade secrecy encompasses more than exact duplication. Trade secret protection would be "quite hollow," in one court's words, if it were not "flexible enough to reach modifications."[53] The Restatement (Third) of Unfair Competition instructs that "an actor is liable for using the trade secret [even] with independently created improvements or modifications if the result is substantially derived from the trade secret . . . ."[54] Under this substantial-derivation standard, there is no actionable use "if the contribution made by the trade secret is so slight that the actor's product or process can be said to derive from other sources of information or from independent creation . . . ."

Several trade secret cases recite this Restatement formulation in assessing when similarity becomes actionable.[55] In theory, at least, "substantial derivation" comprises two questions. First, as a threshold, factual matter, did the defendant rely on or benefit from information obtained from the plaintiff (as opposed to an entirely indepen-

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52. We say most likely, rather than exclusively, because the firm that hires the former employee or associate might itself face a claim for third-party use. That possibility is discussed further in section III.A below.

53. *American Can*, 742 F.2d at 329–30. *See also* Restatement (Third), *supra* note 5, § 40, cmt. c (explaining that the defendant's "unauthorized use need not extend to every aspect of feature of a trade secret" to give rise to liability).

54. Restatement (Third), *supra* note 5, § 40 cmt. c.

55. *See, e.g.*, GlobeRanger Corp. v. Software AG USA Inc., 836 F.3d 447, 498–99 (5th Cir. 2016); Penalty Kick Mgmt., Ltd. v. Coca Cola Co., 318 F.3d 1284, 1293 (11th Cir. 2003); SpearMarketing Inc. v. BancorpSouth Bank, 791 F.3d 586, 601 (5th Cir. 2015); EarthCam Inc. v. OxBlue Corp., 49 F.Supp.3d 1210, 1225 (N.D. Ga. 2014); Callaway Golf Co. v. Dunlop Slazenger Gr. Americas, Inc., 325 F. Supp. 2d 457, 460-61 (D. Del. 2004).

dent R&D process)? If so, a second question follows: was that reliance significant enough, as a normative matter, to warrant liability? As the Restatement emphasizes, some contributions will be "so slight" that the defendant cannot be held to have truly "used" the secret in a way the law should penalize.

Despite the Restatement's nod toward a materiality threshold, many cases minimize or ignore it. They instead emphasize the defendant's exposure to or reliance on any aspect of the plaintiff's secret. Whether that aspect was significant doesn't come up.

This inattention to materiality comes in different forms. In some cases, the court is so preoccupied with a defendant's admission of use that it doesn't seem to care that the information used was publicly available—and thus unprotectable in the first place. In *Smith v. Dravo Corp.*, for example, the defendant sold shipping containers, allegedly based on information that it received during confidential negotiations to acquire the plaintiff's business.[56] Because much of the information was readily ascertainable from the containers that the plaintiff itself openly sold, the district court found no improper use of trade secret information.[57] But the Seventh Circuit disagreed, reasoning that even if the defendant could have obtained information from public sources, it in fact had not.[58] The court deemed the defendant's use improper because its containers were "strikingly similar" to the plaintiff's. Left unaddressed was the fact that many of those similarities were attributable to the containers' publicly observable features.[59] The court neither isolated this unprotectable information nor asked whether the defendant had incorporated a qualitatively significant amount of protectable information.

Similarly, in *Rohm & Haas Co. v. Adco Chemical Co.*, the Third Circuit held a defendant liable for using a secret process for manufacturing latex paint vehicles, even though prior publications had revealed much of the relevant information already.[60]

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56. Smith v. Dravo Corp., 203 F.2d 369 (7th Cir. 1953).

57. *Id.* at 374.

58. *Id.* at 374–75 (citing with approval Pennsylvania's approach that asks "how did defendant learn of plaintiff's design," rather than whether "the design could have been obtained through inspection").

59. *Id.* at 377.

60. 689 F.2d 424, 431 (3d Cir. 1982); *see also* Franke v. Wiltschek, 209 F.2d 493, 495 (2d Cir. 1953) ("It matters not that defendants could have gained their knowledge from a study of the expired patent and plaintiffs' publicly marketed product. The fact is that they did not. Instead they gained it from plaintiffs via their confidential relationship . . . .")

That the defendant happened to learn the information from the plaintiff, not from those publications, was enough. Likewise, in *Affiliated Hospital Products, Inc. v. Baldwin,* aspects of the plaintiff's process for manufacturing hypodermic needles were "already in the public domain" or could have been gleaned from "the end product, the machine itself."[61] That public availability didn't matter. Instead, the fact that the defendants "admitted they looked at" the plaintiff's design plans dominated the court's misappropriation analysis.[62]

In other cases, the plaintiff's secret may at least be protectable, but the court ignores or minimizes significant dissimilarities between it and the defendant's product. Instead, it focuses on defendant's access to the plaintiff's secret, seemingly indifferent to whether the copied elements were significant or trivial. A recent pair of software cases from the Fifth Circuit illustrates the contrasts.

In *Spear Marketing, Inc. v. BancorpSouth Bank,* the court reasoned that because the plaintiff's and defendant's competing bank inventory–management programs were insufficiently similar, the defendant could not have used the plaintiff's trade secrets.[63] Direct evidence had established that the defendant had been exposed to the secret. But the court required more than this.[64] It noted that the plaintiff could "point to no similarity" between the programs' interfaces and had failed to introduce any expert testimony "perform[ing] a side-by-side comparison of the two programs." Instead the plaintiff had merely touted the similarity of the two programs' "general function." Rejecting such a "toothless" view of similarity, the court concluded that "[s]uch an overly generous application of the [use] test would allow an inference of use in virtually every trade secret misappropriation claim in which there is evidence" that the defendant had access to plaintiff's proprietary information.[65] Despite trade secret law's generally "broad" definition of use,[66] the court nonetheless signaled that

61. 57 Ill. App. 3d 800, 806–07 (1978); *see also* Reingold v. Swiftships, Inc., 126 F.3d 645, 652 (5th Cir. 1997) (failing to isolate information contained in a secret fiberglass boat mold that could be readily ascertained from "pre-existing hulls [that] were in the public domain").

62. 57 Ill. App. 3d at 807.

63. 791 F.3d 586, 590 (5th Cir. 2015) (observing that, among other differences, the defendant's program incorporated "different predictive algorithms" and involved a closer "integr[ation] with the rest of the bank's operating system" than the plaintiff's.).

64. *Id.* at 601 (citing RESTATEMENT (THIRD), *supra* note 5, § 40 cmt. c).

65. *Id.* at 602.

66. *Id.* at 600.

succeeding on a substantial derivation theory demands some showing of materiality, at least in cases where "the trade secret at issue is a *technical* feature of a computer program."[67]

That proposition appears to have lasted barely more than a year before the same court changed course. In *GlobeRanger Corp. v. Software AG US Inc.,* the defendant had allegedly used trade secrets to develop a competing inventory-management software.[68] The Fifth Circuit upheld the jury's verdict of misappropriation. On the issue of improper use, the court was unmoved by a "lack of similarity evidence" between the competitors' software.[69] It was enough that they "perform[ed] similar functions."[70] In the court's view, a properly "broad" definition of trade secret use required only access to confidential information[71] plus "any exploitation" or use "on any level," "in any way," or "any part," including any "reliance . . . in facilitating research and development."[72] To the extent that the panel in *Spear* had suggested otherwise, it had been wrong.

Such sweeping language is common.[73] In some judicial formulations, the use element essentially becomes a "but for" test: if the defendant wouldn't have thought to pursue a particular research project without having first been exposed to the secret, it has committed misappropriation—regardless of how far afield that research leads.[74] In such cases, it doesn't seem to matter if the defendant's product is significantly

67. *Id.* at 600–01 (emphasis in original).

68. 836 F.3d 477 (5th Cir. 2016). Curiously, the plaintiff did not have to provide any "specific description of the trade secrets." *Id.* at 492–93 (quoting *Wellogix,* 716 F.3d at 875.)

69. *Id.* at 497.

70. *Id.* at 499.

71. *Id.* at 499.

72. *Id.* at 498 (quoting *Plains Cotton,* 807 F.2d at 1263).

73. *See, e.g.*, Think Village-Kiwi, LLC v. Adobe Sys. No. C 08–04166 SI, 2009 WL 3837270, at **3–4 (N.D. Cal. Nov. 16, 2009); Affiliated Hospital Products, Inc. v. Baldwin, 373 N.E.2d 1000, 1006 (App. Ct. Ill. 1978); Superior Flux & Mfg. Co. v. H&S Indus., No. C 79-2327, 1980 WL 30229, at *2 (N.D. Ohio Nov. 20, 1980).

74. *See, e.g.*, Leggett & Platt, Inc. v. Hickory Springs Mfg. Co., 285 F.3d 1353, 1361 (Fed. Cir. 2002) (defining the actionable use standard as whether the defendant "could not have created its product without the use of [the plaintiff's] trade secrets"); Mangren Research & Development Corp. v. Nat'l Chem. Co., 87 F.3d 937, 944 (7th Cir. 1996) (upholding a jury instruction to "find that defendants misappropriated Mangren's trade secrets even if defendants created a new product if defendants could not have done so without use of Mangren's trade secret").

different. Nor does it seem to matter if the defendant is even competing with the plaintiff. Indeed, at least one court has flatly rejected the proposition that it would.[75]

Even when courts pay attention to similarity, they sometimes focus exclusively on quantity rather than its qualitative significance—a bean-counting approach that offers little insight into what work the similarity concept is supposed to be doing. Take, for instance, the Texas Court of Appeals' decision in *Bishop v. Miller*, a case concerning a secret process for mining potash.[76] The defendant, a once-potential investor who had observed the owner's methods but then backed away, argued that the process he employed was so dissimilar to the owner's that no actionable use had occurred. The owner's expert witness opined that the protected method consisted of 21 components, of which the defendant had copied 15.[77] That testimony, said the court, was enough to sustain a jury's verdict of misappropriation despite a competing expert who considered the methods "fundamentally different."[78]

Perhaps this was the right result, or perhaps not. Either way, however, the court never appeared interested in the qualitative significance of those numbers. Is 15 out of 21 an important statistic because the overlap was enough to make the mining processes technologically equivalent? Because it somehow increased the commercial threat to the owner? Or just because 71% seems like a large number? On the face of the opinion, no one can say.

A similarly thin analysis appeared in *Reingold v. Swiftships, Inc*.[79] The case concerned a defendant who had modified a protected 90-foot boat-hull design to create the bow portion of a new 110-foot mold. Though the defendant alleged that it had altered the shape and form of the mold, the court denied summary judgment based in part on an expert's testimony that somewhere between 40 and 45 feet of the design was essentially the same.[80] Of course, one could just as easily say that between 45 and 50 feet of the original mold was entirely different. Future litigants are left to guess

75. *See* Collelo v. Geographic Servs., Inc., 727 S.E.2d 55, 61–62 (Va. 2012) (reversing a favorable ruling for a defendant that did not compete with the plaintiff and holding that a misappropriation claim does not require "us[ing] the allegedly misappropriated trade secret to compete with the holder of the trade secret").

76. 412 S.W.3d 758 (Tex. Ct. App. 2013).

77. *Id.* at 774.

78. *Id.* at 774–75.

79. 126 F.3d 645 (5th Cir. 1997).

80. *Id.* at 649–51.

why these numbers matter.

While such shallow focus on quantitative similarity will often hand plaintiffs dubious victories, it could also deprive them of deserved ones. The decision in *Dresser Indus. v. Forscan Corp.* shows how.[81] After the plaintiff accused its employee of handing a competitor trade secrets over an electronic device, the appeals court refused to enjoin the sale of the defendant's devices in part because the plaintiff "only characterized 25 of 1000 components of the tool as being similar."[82] Here, again, the mistake isn't that the reported opinion necessarily gets the answer wrong—wrong or right in this case isn't terribly obvious. The mistake is that the court doesn't seem interested in asking the right question. The court's discussion lacks a qualitative dimension. Perhaps those 25 components were the true point of novelty within the proprietary technology, while the other 975 were well-known in the field or unimportant surplusage. If so, the "1000" denominator of the court's fraction would grossly understate the plaintiff's contribution to the defendant's product.[83]

In sum, while in theory the Restatement's substantial derivation framework may allow courts to address a use's materiality, in practice many simply don't bother. One possible source of guidance is other IP regimes with more established jurisprudences on actionable similarity. As the following two sections discuss, some cases have looked beyond trade secret precedent. Some have drawn analogies to patent law. A few others have invoked copyright law. In none of them, however, does the analogy seem to advance the analysis much.

C. Analogies to Patent Law

The notion that trade secret law might borrow from patent law has an immediate appeal. Patent law covers functional inventions, from machinery to pharmaceuticals,[84] and much of what could be patented could be maintained as a trade secret in-

81. 641 S.W.2d 311 (Tex. Ct. App. 1982).

82. *Id.* at 317.

83. *See also* Leo Silfen, Inc. v. Cream, 278 N.E.2d 636 (N.Y. App. Div. 1972) (concluding that the defendant's contacting of "47 out of 1,100 of plaintiffs' customers . . . based on casual memory" did not constitute misappropriation of the plaintiff's customer list, without assessing the importance of the particular customers at issue).

84. *See* 35 U.S.C. § 101 ("Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent . . .")

stead. Unsurprisingly, then, many trade secret cases have referenced patent doctrine in sorting through a defendant's derivation.[85] Indeed, the connection between the two has a lengthy pedigree, going back at least to a 1927 decision by Judge Augustus Hand.[86]

Nevertheless, any analogy between these two regimes inevitably reaches a stumbling block. While trade secret scope is never defined on paper until it's adjudicated, patent scope revolves around the written word. Patent cases compare the defendant's product not with any tangible thing but with the patent document's "claims," highly stylized declarations of scope that courts often dub the "metes and bounds" of the invention.[87] A patent plaintiff must typically prove that each literal element within the relevant claim can be found within the defendant's product.[88]

As a result, when trade secret cases bring up patent law, they nearly always have in mind a judge-made exception called the doctrine of equivalents.[89] Under that doc-

85. *See, e.g.*, Reingold v. Swiftships, Inc., 126 F.3d 645, 651 (5th Cir. 1997); American Can Co. v. Mansukhani, 742 F.2d 314, 330 (7th Cir. 1984); Motorola, Inc. v. Computer Displays Int'l, Inc., 739 F.2d 1149, 1157–58 (7th Cir. 1984); Syntex Opthalmics, Inc. v. Tsuetaki, 701 F.2d 677 (7th Cir. 1983); Bolt Assocs. v. Alpine Geophysical Assocs., 365 F.2d 742, 748 (3d Cir. 1966); Sinclair v. Aquarius, 42 Cal. App. 3d 216, 222 (1974); Materials Dev. Corp. v. Atl. Advanced Metals, Inc., 172 U.S.P.Q. 595, 615 (Mass. Super. Ct. 1971); Cataphote Corp. v. Hudson, 422 F.2d 1290, 1294 (5th Cir. 1970); Minn. Min. & Mfg. Co. v. Tech. Tape Corp., 221 N.Y.S.2d 58, 60–61 (1961). *But see* BladeRoom Gr. Ltd. v. Facebook, Inc., Case No. 5:15-cv-01370-EJD, 2018 WL 514923 514923, at *8–9 (N.D. Cal. Jan. 23, 2018) ("[T]he method of defending against patent infringement by comparing claim limitations to elements, and showing that one does not read on the other, is unsuited to showing the absence of a triable fact of trade secret misappropriation."); In re Wilson, 199 F.3d 1329 (4th Cir. 1999) (unpublished table opinion) (asserting without authority that the doctrine of equivalents is "primarily a patent law doctrine and its application in the trade secret context has been quite limited" and therefore refusing to consider it in assessing the alleged substantial derivation of a trade secret).

86. Tower Mfg. Co. v. Monsanto Chem. Works, 20 F.2d 386 (S.D.N.Y 1927).

87. *E.g.*, In re Vamco Mach. & Tool, Inc., 752 F.2d 1564, 1577 n.5 (Fed. Cir. 1985). The Patent Act requires patentees to include "one or more claims particularly pointing out and distinctly claiming the subject matter that the applicant regards as his invention." 35 U.S.C. § 112. Early American patent law did not require them, however, leaving validity and infringement to be determined based on the written description of the invention. *See, e.g.*, Jeanne C. Fromer, *Claiming Intellectual Property,* 76 U. Chi. L. Rev. 719, 721 (2009); J. Jonas Anderson & Peter S. Menell, *Informal Deference: A Historical, Empirical, and Normative Analysis of Patent Claim Construction,* 108 Nw. U. L. Rev. 110–11 (2013).

88. *See, e.g.*, Advanced Steel Recovery, LLC v. X-Body Equip., Inc., 808 F.3d 1313, 1319 (Fed. Cir. 2015) ("To establish literal infringement, every limitation set forth in a claim must be found in an accused product, exactly.")

89. One recent exception is *Contour Design, Inc. v. Chance Mold Steel, Co.*, 693 F.3d 102 (1st Cir. 2012).

trine, a product that skirts the literal words of a particular claim element may nonetheless infringe if it comes close enough.[90] To determine whether the defendant's device crosses that line, many courts ask whether an expert in the field would consider it "insubstantially different" or find that it "performs substantially the same function in substantially the same way to obtain substantially the same result" as the claim limitation.[91] The Supreme Court has endorsed this common-law expansion of patent scope on the grounds that claim drafting is necessarily inexact and that copyists should not be allowed to change minor details of an invention to avoid a patent's literal scope.[92]

Yet aside from the innocuous but unhelpful recognition that trade secret misappropriation can encompass a defendant's trivial modifications, courts' analogies to patent law are superficial. To begin with, modern patent law's equivalents analysis remains tied to the written claim. In an earlier era, patent cases would find equivalence by comparing the overall similarity between the plaintiff's and defendant's products.[93] But today a patentee must demonstrate equivalence between each element in

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That case drew instead from § 102(f) of the prior Patent Act, a provision concerning validity rather than infringement, to interpret the meaning of the term "derived" in a non-disclosure agreement. *Id.*

90. *See* Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 21 (1997).

91. *E.g.*, David Netzer Consulting Eng'r LLC v. Shell Oil Co., 824 F.3d 989, 998 (Fed. Cir. 2016). The trial court may choose which test to apply based on the facts involved. *See Warner-Jenkinson Co.*, 520 U.S. at 39–40 (concluding that the precise formulation of the test is "less important than whether the test is probative of the essential inquiry: Does the accused product or process contain elements identical or equivalent to each claimed element of the patented invention?"). Some supplement these tests by looking into the "known interchangeability" of claimed elements with features of the accused product. *See, e.g.*, Hearing Components, Inc. v. Shure Inc., 600 F.3d 1357, 1370–71 (Fed. Cir. 2010).

92. *See, e.g.*, Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722, 731 (2002) ("If patents were always interpreted by their literal terms . . . . [u]nimportant and insubstantial substitutes . . . could defeat the patent, and its value to inventors could be destroyed by simple acts of copying."); Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 607 (1950) (explaining that limiting patent scope to claims' literal terms "would leave room for—indeed encourage—the unscrupulous copyist to make unimportant and insubstantial changes and substitutions").

93. *See, e.g.*, *Graver Tank*, 339 U.S. at 610 (comparing the parties' compositions and finding the two "substantially identical in operation and in result"). In the era before patent claims were required, courts' analysis of patent infringement analysis bore "a remarkable resemblance" to *Graver Tank's* product-focused equivalence analysis. In the era of patent claiming, however, the doctrine of equivalents is seen as "an exception to the general rule that infringement is determined by claim language." Robert P. Merges & John F. Duffy, Patent Law & Policy: Cases and Materials 813 (6th ed. 2013); *see also* Michael J. Meurer & Craig Allen Nard, *Invention, Refinement, and Patent Claim Scope: A New Perspective on the Doctrine of Equivalents,* 93 Geo. L.J. 1947, 1963

the claim language and some corresponding structure in the accused device.[94] "Generalized testimony as to the overall similarity between the claims and the accused infringer's product or process will not suffice."[95] One missing element from the claim dooms a plaintiff's case, no matter how similar the rest of the defendant's product.

Trade secrets, by contrast, have no formal claims that predate litigation.[96] Nor do they come presorted into elements.[97] Courts must instead figure out trade secret scope on the spot.[98] Since the doctrine of equivalents has evolved into a tool to help map words onto physical things, it offers little substantive guidance for trade secrecy cases. Unsurprisingly, then, the cases that invoke the doctrine of equivalents do not appear to draw any substantive lesson from it. It's little more than jurisprudential name-dropping.

Reingold, the case about modified boat hulls discussed above, is a characteristic

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(2004) ("As the prominence of claims increased, the equitable standards for non-literal patent infringement coalesced into the doctrine of equivalents").

94. *Warner-Jenkinson Co.*, 520 U.S. at 21, 29. *Cf.* Dan A. Burk & Mark Lemley, *Quantum Patent Mechanics*, 91 Lewis & Clark L. Rev. 29 (2005) (critiquing the way that courts identify an invention's "elements").

95. Tex. Instruments Inc. v. Cypress Semiconductor Corp., 90 F.3d 1558, 1567 (Fed. Cir. 1996).

96. During litigation, some jurisdictions require plaintiffs to describe the allegedly misappropriated trade secrets with "sufficient particularity." *See, e.g.*, Imax Corp. v. Cinema Tech. Inc., 152 F.3d 1161 (9th Cir. 1998). California goes further than most by statutorily requiring plaintiffs to identify trade secrets with "reasonable particularity" before discovery begins. *See* Cal. Code Civ. Proc. § 2019.210.

97. In some sense, to be sure, patent claims don't come presorted, either. One can't break a claim into constituent elements without knowing where one element ends and the next begins, and the answer is often contestable. *See* Burk & Lemley, *supra* note 94, at 31 (noting the lack of an established standard "as to either the size of the textual element or the level of abstraction at which the element will be evaluated" and that "[c]ourts define an element almost arbitrarily"); Matthew C. Phillips, *Taking a Step Beyond* Maxwell *to Tame the Doctrine of Equivalents*, 11 Fordham Intell. Prop. Media & Ent. L.J. 155, 162 (2000) ("The definition of an 'element' is slippery and probably cannot be settled without some resort to arbitrariness."). Nevertheless, claims at least arrive with a fixed text over which to argue. To disaggregate physical objects into elements, by contrast, would require a new text to be constructed from scratch, even if only in the mind of the disaggregator. As interpretively complex as the identification of textual elements is, that complexity is only multiplied when there is no agreed-upon language in which to find them.

98. A court's task is complicated by the fact that, in the absence of an ex ante claiming regime, plaintiffs are more likely to make "strategic" assertions regarding the scope of their intellectual property rights during litigation. *See* Jeanne C. Fromer & Mark. P. McKenna, *Claiming Design*, 167 U. Pa. L. Rev. 123, 169 (2018).

example.[99] The court there denied a motion to dismiss the claim on summary judgment, concluding that something more than "outright and forth right duplication" could still trigger liability just as it might under patent law's "analogous problem of patent equivalents."[100] But although in the patent context one would have expected to see some discussion of the alleged equivalents' substantiality, the *Reingold* court offered none.

Indeed, in the one misappropriation decision we've found where a defendant actually pressed for a more rigorous application of the doctrine of equivalents, the court refused. In that case, the plaintiff accused Facebook of unlawfully using its data-center technology, while Facebook argued that its product was simply too different to subject it to liability.[101] In moving for summary judgment, Facebook asked the court to break down the trade secret into "components and then compare these components to [those] of the accused product," just as it would in the equivalents analysis "normally reserved for patent infringement cases."[102] The court denied the motion. It held that "[t]he broad definition of 'use' applicable to trade secret claims" made an element-by-element comparison "unsuited to showing the absence of a triable fact of trade secret misappropriation."[103]

D. Analogies to Copyright Law

While judges seeking doctrinal parallels in other IP regimes most commonly look to patent law, a handful of cases have drawn instead from copyright.[104] Copy-

99. *See supra* text accompanying notes 89–90.

100. Reingold v. Swiftships, Inc., 126 F. 3d 645, 651 (*quoting* Graver Tank & Mfg., Co. v. Linde Air Products, Co., 339 U.S. 605, 607, (1950)).

101. BladeRoom Gr. Ltd. v. Facebook, Inc., No. 15-cv-01370, 2018 WL 514923, at *8–*9 (N.D. Cal. Jan. 23, 2018).

102. *Id.* at *8.

103. *Id.* at *9. The parties would ultimately settle in the middle of trial. *See* Bonnie Eslinger, *Facebook Settles $365M Trade Secrets Case Mid-Trial*, Law360 (Apr. 9, 2018, 1:08 pm), https://www.law360.com/articles/1031167/facebook-settles-365m-trade-secrets-case-mid-trial.

104. *See, e.g.*, Comprehensive Techs. Int'l v. Software Artisans, Inc., 3 F.3d 730 (4th Cir. 1993), *vacated pursuant to settlement* (Sept. 30, 1993); Engenium Solutions, Inc. v. Symphonic Techs., Inc. 924 F. Supp. 2d 757 (S.D. Tex. 2013); Integral Sys. v. Peoplesoft, Inc., 1991 WL 498874 (N.D. Cal. July 19, 1991).

right law covers works of authorship such as books, music, films, and software[105]—though it's virtually always the last of these that is at issue in cases on trade secret derivation.[106] If the judges in these cases are aware of their peers' reliance on patent law, they don't say so. But just as in the patent-analogy cases, the move to copyright doctrine ends up doing little work in the analysis.

Copyright protection extends only to a work's particular expression of ideas, not to the ideas themselves.[107] Still, far more than the complete, literal text falls on the "expression" side of the divide. Abstract patterns and fragments of a work can qualify, from a plotline in a narrative work to a melody lines in a musical one. As a result, copyright ends up policing against not only verbatim but also nonverbatim copying, "else a plagiarist would escape by immaterial variations," in Judge Learned Hand's famous phrasing.[108] At the same time, the law also recognizes that "not all copying . . . is copyright infringement."[109] Just as in trade secret and patent law, the trick is figuring out which is which.

To accomplish that task, copyright doesn't look to any prewritten claims as patent law does. Instead, it assesses the works' likeness directly through two theoretically distinct but practically overlapping doctrines: substantial similarity and the derivative work right. First, in order to succeed on any claim of infringement under the Copyright Act, a plaintiff must show that its work is substantially similar to the defendant's.[110] Merely copying something from a work isn't enough. The copied expres-

105. *See* 17 U.S.C. § 102(a).

106. The one non-software case that we have found in this category should never have included a trade secrecy claim to begin with. In *Stromback v. New Line Cinema*, the purported secrets at issue were a screenplay and a poem. 384 F.3d 283 (6th Cir. 2004). Because these expressive goods require public dissemination to achieve economic value, the court rightly found them to be ineligible subject matter for trade secret protection. But as an alternative basis for dismissal, the court also concluded that the only similarities between the defendant's and plaintiff's works were stock themes, which by definition are not secrets.

107. *Id.* § 102(b); Nichols v. Universal Pictures Corp., 45 F.2d 119 (2d Cir. 1930).

108. *Nichols*, 45 F.2d at 121.

109. Feist Publ'ns, Inc. v. Rural Tel. Serv. Co., 499 U.S. 340, 361 (1991).

110. *See, e.g.*, *Nichols*, 45 F.2d at 121 ("[T]he question is whether the part so taken is substantial."); ROBERT C. OSTERBERG & ERIC C. OSTERBERG, SUBSTANTIAL SIMILARITY IN COPYRIGHT LAW § 1:1 (2017); WILLIAM F. PATRY, 3 PATRY ON COPYRIGHT § 9:59 (2017) ("For copying to constitute infringement, a defendant must have reproduced a material amount of the plaintiff 's expression, or as is frequently stated, the parties' works must be 'substantially similar.'").

sion must also be quantitatively or qualitatively significant.[111] This judge-made gloss on statutory copyright protection functions as a materiality threshold for all infringement actions.[112]

Second, the Copyright Act also grants owners the exclusive right to "prepare derivative works based upon the copyrighted work."[113] Many courts identify a work as a derivative by asking whether it would qualify as substantially similar under the reproduction right, seemingly conditioning infringement of one right on infringement of another.[114] The derivative work right thus often ends up covering the same ground that the substantial similarity doctrine already covers.[115] Indeed, the derivative work right's primary real-world effect may simply be to enlarge the reproduction right with which it so often travels.[116] For that reason, we discuss them as a pair.

In order to assess unlawful similarity, courts have developed different approaches depending on how technically complex the work's subject matter is. In most cases involving artistic works like novels or paintings, they instruct juries to adopt a layperson's perspective.[117] The question of fact posed to this hypothetical layperson is, in

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111. *See* Harper & Row Publ'ns v. Nation Enters., 471 U.S. 539, 543, 548–49 (1985).

112. *See* Shyamkrishna Balganesh, *The Normativity of Copying in Copyright Law*, 62 Duke L.J. 203, 206 (2012) (explaining that substantial similarity doctrine "places the burden to establish that the defendant's copying is actionable as a legal proposition on the plaintiff in a copyright-infringement suit, even when the copying is shown to exist as a factual matter.").

113. 17 U.S.C. § 106(2). The statute defines derivative works broadly as "work[s] based upon one or more preexisting works" and includes a representative catalog of examples like translations and abridgments. 17 U.S.C. § 101.

114. *See, e.g.*, Well-Made Toy Mfg. Corp. v. Goffa Int'l Corp., 354 F.3d 112, 117 (2d Cir. 2003), *abrogated on other grounds by* Reed Elsevier, Inc. v. Muchnick, 559 U.S. 154 (2010) (noting that the same "substantial similarity" test applies whether the defendant's product is analyzed as a reproduced work or a derivative work); Litchfield v. Spielberg, 736 F.2d 1352, 1357 (9th Cir. 1984) (stating that the derivative work standard examines whether the accused work "would be considered an infringing work if the material which it has derived from a prior work had been taken without the consent of a copyright proprietor of such prior work" (quoting United States v. Taxe, 540 F.2d 961, 965 n.2 (9th Cir. 1976) (emphasis added)) (internal quotation mark omitted)).

115. *See, e.g.*, Melville B. Nimmer & David Nimmer, Nimmer on Copyright § 8.09[A] (2017); Michael Abramowicz, *A Theory of Copyright's Derivative Right and Related Doctrines*, 90 Minn. L. Rev. 317, 334–35 (2005); Joseph P. Fishman, *Creating Around Copyright*, 128 Harv. L. Rev. 1333, 1347 (2015); Jeanne C. Fromer, *An Information Theory of Copyright Law*, 64 Emory L.J. 71, 109–10 (2014); Lemley, *supra* note 3, at 1018–19.

116. *See* Christina Bohannan, *Reclaiming Copyright*, 23 Cardozo Arts & Ent. L.J. 567, 599–600 (2006).

117. *See, e.g.*, Rottlund Co. v. Pinnacle Corp., 452 F.3d at 726, 731 (8th Cir. 2006); Boisson v. Banian, 273

one leading formulation's words, whether "the ordinary observer, unless he set out to detect disparities, would be disposed to overlook them, and regard their aesthetic appeal as the same."[118]

In cases involving technical works like software code, by contrast, courts are more willing to consult technical experts. In a widely-influential decision, the Second Circuit concluded in *Computer Associates Int'l v. Altai, Inc.* that the ordinary layperson could not make sufficient sense of code's complexities.[119] Approvingly quoting the lower court, it explained that "[i]n the context of computer programs, many of the familiar tests of similarity prove to be inadequate, for they were developed historically in the context of artistic and literary, rather than utilitarian, works."[120] *Altai* tells courts in software-infringement cases to abstract the program into various levels of generality (from overall objectives at the top all the way down to the object code at

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F.3d 262, 272 (2d Cir. 2001); Yankee Candle Co., Inc. v. Bridgewater Candle Co., LLC, 259 F.3d 25, 33–34 (1st Cir. 2001); Leigh v. Warner Bros., Inc., 212 F.3d 1210, 1214 (11th Cir. 2000); Universal Athletic Sales Co. v. Salkeld, 511 F.2d 904, 907 (3d Cir. 1975).

118. *Boisson*, 273 F.3d at 272. The gravitational pull of this "ordinary observer" standard traces back to the Second Circuit's 1946 opinion in *Arnstein v. Porter*. 154 F.2d 464, 467 (2d Cir. 1946). Various courts of appeal have put their own individual stamp on the test, though *Arnstein*'s factual subjectivity remains copyright's touchstone for assessing legally actionable similarity. The most important of these is the Ninth Circuit, which has subdivided the question of similarity into "intrinsic" and "extrinsic" inquiries. *See* Sid & Marty Krofft Television Prods., Inc. v. McDonald's Corp., 562 F.2d 1157, 1162–65 (9th Cir. 1977). While the intrinsic test retains the focus on observers' holistic impressions, the extrinsic test allows some degree of analytic dissection, often with the help of expert testimony. *See* Three Boys Music Corp. v. Bolton, 212 F.3d 477, 485 (9th Cir. 2000). Later decisions have acknowledged that these terms are a poor fit for the concepts they describe; the two-step analysis could "more sensibly described as objective and subjective analyses of expression." Shaw v. Lindheim, 919 F.2d 1353, 1357 (9th Cir. 1990).

119. 982 F.2d 693, 713 (2d Cir. 1992) (remarking that while a reasonable-person approach "may well have served its purpose when the material under scrutiny was limited to art forms readily comprehensible and generally familiar to the average lay person[,] . . . . computer programs are likely to be somewhat impenetrable by lay observers—whether they be judges or juries . . . ."); *see also* Mark A. Lemley, *Our Bizarre System for Proving Copyright Infringement*, 57 J. Copyright Soc'y USA 719, 733 (2010) (noting the exceptionality of software cases and that "[v]irtually all the courts considering infringement of computer code have permitted expert testimony as to . . . the issue of improper appropriation").

120. *Id.* (quoting 775 F. Supp. 544, 558 (1991)). The court was careful to emphasize that it did not "intend to disturb the traditional role of lay observers in judging substantial similarity in copyright cases that involve the aesthetic arts, such as music, visual works or literature." *Id.* at 713–14. For an argument that the literary arts have their own interpretive complexities that demand precisely such a disturbance, see Zahr K. Said, *Reforming Copyright Interpretation*, 28 Harv. J. L. & Tech. 469 (2015).

the bottom); filter out any uncopyrightable elements, including both the higher levels of abstraction as well as unprotectable details like public-domain material, methods of operation, and well-known programming techniques; and then compare the remaining expressive kernel with the corresponding elements in the allegedly infringing program.[121] Other circuits have since followed the Second Circuit's lead.[122]

If courts are going to invoke copyright law to decide trade secret derivation cases, one might have expected them to feature *Altai*'s dissective approach prominently. But they don't. Nor do they seem to agree on whether copyright's threshold for actionable similarity should be less than, more than, or the same as trade secrecy's. Their only common denominator is the same proposition for which other trade secret cases mention patent doctrine: that *some* nonliteral similarity can trigger liability. Never quite explained is how much. As a result, they do little to justify whether trade secret analysis should be looking to copyright doctrine to begin with, and, if so, which way that comparison would cut.

In *Comprehensive Technologies International v. Software Artisans, Inc.*,[123] for example, the Fourth Circuit observed in dicta that trade secrecy's similarity threshold ought to be lower than copyright's. It reasoned that a trade secret, unlike a copyright, affords its owner control over ideas (rather than merely those ideas' expression).[124] As a result, two works "may be sufficiently dissimilar on the level of expression to defeat liability for copyright infringement, but they may be sufficiently similar on a more abstract or ideational level to establish liability for trade secret misappropriation."[125] Because the computer programs at issue in the case were so radically dissimilar at even this more generalized "ideational" level, the court never needed to fix the quantum of actionable similarity any more precisely than this. Nevertheless, it still signaled to future litigants that a trade secret owner has a right to control a wider range of derivatives than would a copyright owner.

Contrast that position with the one adopted by the district court in *Integral Sys-*

121. 982 F.2d at 710.

122. *See, e.g.*, Gen. Universal Sys., Inc. v. Lee, 379 F.3d 131, 142 (5th Cir. 2004); Gates Rubber Co. v. Bando Chem. Indus., Ltd., 9 F.3d 823, 834-36 (10th Cir. 1993).

123. 3 F.3d 730 (4th Cir. 1993), *vacated pursuant to settlement* (Sept. 30, 1993).

124. *Id.* at 736 n.7.

125. *Id.*

tem v. Peoplesoft, Inc.,[126] another dispute over software. The plaintiff alleged both copyright infringement and trade secret misappropriation. In dismissing both claims, the court noted that the parties cited no authority or standard on the question of similarity in trade secret cases, instead relying on the same arguments they had made regarding copyright infringement.[127] Without considering potential differences between the two forms of liability, the court essentially copied its noninfringement holding from the copyright analysis and pasted it into its trade secrecy analysis. "At a minimum," it asserted, "the 'substantial identity' test under trade secret law would seem no less stringent than the 'substantial similarity" test applied under claims of infringement."[128] In the court's view, then, the similarity threshold for trade secret misappropriation is at least as demanding of plaintiffs—perhaps even more, but certainly not less—than its copyright cousin. The court seemed to assume this proposition to be self-evident, offering no rationale for the comparison.

Such double-duty similarity analysis also appeared in *Engenium Solutions, Inc. v. Symphonic Technologies, Inc.*[129] After deciding that a jury could reasonably find the plaintiff's copyrighted software to be substantially similar to the defendant's, the court incorporated that finding by reference when it turned to the trade secrecy claim. It noted the existence of the "many similarities" that supported its decision not to dismiss the copyright claim, but it never considered whether similarity ought to be measured the same way on the trade secrecy side.[130]

It's puzzling that only these few cases so much as raise a possible copyright connection. It can't be out of judges' reasoned choice to favor patent doctrine or a sui generis approach in trade secrecy disputes—the reasoning simply never appears in a judicial decision. Courts seem unaware that the choice is even available. Indeed, the likeliest explanation for why these cases gesture toward copyright at all is simply proximity within the legal briefs. The plaintiff in each case had asked the court to adjudicate both copyright and trade secrecy claims alongside each other. Having put in the legwork to assess the works' substantial similarity under copyright law, these courts may reflexively be applying the same analysis again for trade secrecy.

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126. 1991 WL 498874 (N.D. Cal. July 19, 1991).

127. *Id.* at *10.

128. *Id.*

129. 924 F. Supp. 2d 757 (S.D. Tex. 2013).

130. *Id.* at 795–96.

II. DEFINING SUBSTANTIAL DERIVATION

If there were a good reason for trade secrets to give their owners broader control of adaptive uses than do patents or copyrights, then we would defend its exceptionalism.[131] But if anything, the current law gets things backwards. The case for narrowing an owner's control of adaptive uses is arguably even stronger for trade secrets than for other areas of IP. That case revolves around the owner's scope of exclusivity and the range of alternatives available to would-be defendants trying to avoid liability. Start with copyrights and patents. When a second comer winds up unable to use copyrighted or patented information, a substitute is often available, even if imperfect. Indeed, both bodies of law contain judge-made doctrines designed to prevent an owner's entitlement from growing so broad as to exhaust resources for downstream innovation within the field.[132] Beyond limiting the scope of upstream entitlements, each regime in its own way tries to subsidize second comers' ability to avoid infringement. Copyright doctrine, as section A below outlines, shows special solicitude for downstream authors who use the owner's work in interim drafts only in order to ultimately avoid it. Patent doctrine, meanwhile, tries to to cabin the doctrine of equivalents to ensure that inventors' design-around efforts don't subject them to enhanced damages for willfulness if they guess wrong and end up infringing the patent.[133] Turning from results to rhetoric, courts view such attempts to circumvent others' exclusive rights as a healthy part of the IP system.[134] Both regimes, in sum, signal that

131. *Cf.* Mark A. Lemley, *The Fruit of the Poisonous Tree in IP Law*, 103 Iowa L. Rev. 245, 263 (2017) (noting that differences between IP regimes aren't necessarily bad).

132. *See, e.g.*, Gates Rubber Co. v. Bando Chemical Indus., 9 F. 3d 823, 838 (10th Cir. 1993) (discussing copyright's merger doctrine, a "prophylactic device to ensure that courts do not unwittingly grant protection to an idea by granting exclusive rights to the only, or one of only a few, means of expressing that idea."); McRO, Inc. v. Bandai Namco Games Am. Inc., 837 F. 3d 1299, 1313–14 (Fed. Cir. 2016) (observing that the "primary concern driving" the jurisprudence around patentable subject matter is ensuring that a patent does not preempt an entire field of inventive activity).

133. *See, e.g.*, State Indus., Inc. v. A.O. Smith Corp., 751 F.2d 1226, 1235–36 (Fed. Cir. 1985) (downplaying the infringer's design-around conduct because "[o]ne of the benefits of a patent system is its so-called 'negative incentive' to 'design around' a competitor's products, even when they are patented, thus bringing a steady flow of innovations to the marketplace," and warning that "[i]t should not be discouraged by punitive damage awards except in cases where conduct is so obnoxious as clearly to call for them").

134. The Federal Circuit has repeatedly endorsed designing around as a driver of creativity and competition. *See, e.g.*, TiVo Inc. v. EchoStar Corp., 646 F.3d 869, 883 (Fed. Cir. 2011) (en banc); Hilton Davis

adapters are welcome.[135]

Trade secrecy, by contrast, gives those adapters no such doctrinal safety valves—and often leaves them with far fewer meaningful choices. A popular refrain in misappropriation cases is that courts "cannot compel a man who changes employers to wipe clean the slate of his memory."[136] True enough. But often it seems like they're trying to. By tying actionable "use" to the conferral of a commercial advantage rather than to the development of a similar product, trade secret law threatens to leave those employees with little alternative but to find different projects altogether.[137] While other IP regimes celebrate designing around, trade secrecy punishes it just the same as outright duplication.[138] Courts scold defendants who study an existing invention and use it "as a springboard to launch [one's] own approach," as if that were a bug

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Chem. Co. v. Warner-Jenkinson Co., 62 F.3d 1512, 1520 (Fed. Cir.) (per curiam), *supplemented by* 64 F.3d 675 (Fed. Cir. 1995) (per curiam), *rev'd on other grounds*, 520 U.S. 17 (1996); Yarway Corp. v. Eur-Control USA, Inc., 775 F.2d 268, 277 (Fed. Cir. 1985); State Indus., Inc. v. A.O. Smith Corp., 751 F.2d 1226, 1235–36 (Fed. Cir. 1985); *see also* James P. Marsh Corp. v. U.S. Gauge Co., 129 F.2d 161, 165 (7th Cir. 1942) (concluding that when a downstream inventor designs around a patent, "the patent system is working at its best. For it is then that we have competition between a holder of a legal monopoly and his competitors."). While copyright cases don't offer the same rhetorical enthusiasm, they still expressly permit the practice. *See, e.g.*, Eden Toys, Inc. v. Marshall Field & Co., 675 F.2d 498, 501 (2d Cir. 1982) ("Even if an alleged copy is based on a copyrighted work, 'a defendant may legitimately avoid infringement by intentionally making sufficient changes in a work which would otherwise be regarded as substantially similar to that of the plaintiff's.'") (quoting Warner Bros. Inc. v. Am. Broad. Co., 654 F.2d 204, 210 (2d Cir. 1981))).

135. We recognize that this welcome might not be as warm as some readers would like. Would the world be a better a place if fair use were easier to prove in court, or patent claim construction less muddy, or if any number of other potential reforms were adopted? Maybe. But we emphasize that our argument is a comparative one. Studying trade secrecy can make scholars of copyright or patent appreciate what they already have.

136. *E.g.*, Futurecraft Corp. v. Clary Corp., 205 Cal. App. 2d 279, 288 (1962).

137. The employer could of course try to continue work on the project through a clean-room approach, without the new employee's help. But doing so would sometimes mean that the person who knows the most about a particular line of research is precisely the one that can't work on it.

138. *See, e.g.*, Smith v. Dravo Corp., 203 F.2d 369 (7th Cir. 1953); Affiliated Hospital Products, Inc. v. Baldwin, 373 N.E.2d 1000, 1006 (App. Ct. Ill. 1978); *see also* Michael R. McGurk & Jia W. Lu, *The Intersection of Patents and Trade Secrets*, 7 HASTINGS SCI. & TECH. L.J. 189, 205 (2015) ("[U]nlike patent cases where a defendant can design around the patent to avoid infringement, a trade secret defendant's design around attempts will not suffice, because designing around a trade secret cannot undo the knowledge and unauthorized use of the trade secret to facilitate the design around.").

rather than a feature of the innovation process.[139] When prior exposure to a trade secret gives an individual knowledge, the case law's "but for" standard of causation essentially tells that individual not to put that knowledge to commercial use.[140] That cannot be the right result for innovation policy.

To a limited degree, trade secrecy case law is already looking for outside guidance on how to police derivation. As the previous Part discussed, courts sometimes gesture toward other exclusive-rights regimes when weighing a defendant's adaptive use of a plaintiff's secret. But these doctrinal analogies, when they happen at all, are almost uniformly superficial. Out of these analogies, judges' favorite is patent law's doctrine of equivalents. Patent practitioners, however, wouldn't recognize much of what they saw. In trade secrecy's hands, the analogy does precious little work beyond the bare and banal proposition that liability doesn't require an absolute identity between products. Courts frequently evaluate trade secrecy's unwritten scope on a gestalt basis, a move that contemporary patent doctrine would deem a cardinal sin.[141]

Some change is needed. In this Part, we propose three of them. The first concerns what courts should be looking *at*. They should focus on the product that the defendant is actually exploiting, not with the defendant's earlier steps along the way. The second and third concern what courts should be looking *for*. It's not enough to show exploitation of some information taken from the plaintiff; the plaintiff must also show that the information materially contributed to a protectable trade secret to begin with. Finally, an owner should be entitled to control exploitation of that material information in reasonably foreseeable markets but not in remote ones that could not have been anticipated ex ante.

There's some precedent for a regime that looks this way. Each of our proposed changes resembles a corresponding feature of copyright's infringement framework. To be sure, in highlighting that resemblance, we're mindful that some consistencies are foolish. Our goal isn't harmonization between exclusive-rights regimes for its own sake. Nevertheless, where a proposed rule seems justified on its theoretical merits, it's still helpful to know that another regime has actually employed a similar rule in practice. In the following sections, we lay out our case for how substantial derivation doc-

139. Monovis, Inc. v. Aquino, 905 F. Supp. 1205, 1232 (W.D.N.Y. 1994). The defendant in *Monovis* had expressly tried to design around a former employer's trade secret, which the court considered damning evidence of misappropriation. *Id.*

140. *See supra* text accompanying note 68 to note 74.

141. *See* Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 21 (1997).

trine could be improved, and how certain copyright infringement doctrines have paved the way.

A. Intermediate and Ultimate Uses

In many trade secret disputes, the defendant is trying to exploit the relevant information in precisely the same way as the plaintiff does. But in others, the defendant is only using the information as a step in the course of researching how to produce something different. Under current law, that use is enough for liability. The doctrine takes what Mark Lemley has called a "fruit of the poisonous tree" approach: a defendant's innovation is tainted, regardless of how different it might be, if it can ultimately be traced back to the plaintiff's secret.[142] The misappropriation occurs as soon as the defendant mentally relies on the secret, wherever that reliance leads.

This choice to define derivation exclusively in terms of the process, not the product, is the foundation of the doctrine's overbreadth. It means that a former employee or business partner who continues in the same line of research virtually always uses the secret simply by knowing it. For all of trade-secret protection's vulnerability to reverse engineering and independent development, it still gives owners a rock-solid right against designing around. As a result, the ones with the most expertise with a particular line of research can be the ones most restricted from working on it.

The problem is particularly acute when the secret covers information on what *not* to do, a category commonly called "negative know-how." Negative know-how can be costly for a firm to develop, and the UTSA considers it just as protectable as any other kind of valuable information.[143] But it's effectively a poison pill for continuing

142. *Id.* at 250–51.

143. *See* UTSA §1, Commissioners' Comment (amended 1985) (explaining that the Act's definition of trade secrets "includes information that has commercial value from a negative viewpoint, for example the results of lengthy and expensive research which proves that a certain process will not work"). This category of trade secrets is controversial among some commentators concerned about forcing people down alleys they already know to be blind. *See, e.g.*, Charles Tait Graves, *The Law of Negative Knowledge: A Critique*, 15 TEX. INTELL. PROP. L.J. 387, 388 (2007) ("Perhaps the strangest theory of trade secret law is the concept of negative know-how, a theory under which an employee who resigns and joins a different business can be liable for not repeating the mistakes and failures of his or her former employer."); Laura G. Pedraza-Farina, *Spill Your (Trade) Secrets: Knowledge Networks as Innovation Drivers*, 92 NOTRE DAME L. REV. 1561, 1595–96 (2017) (arguing that in "complex fields with a background epistemic community," negative know-how shouldn't be eligible for protection and instead treated as general skills and experience).

R&D beyond the originating firm without permission. If you're not repeating what you know are mistakes, you're benefitting—and thus, according to the prevailing standard, misappropriating.

The substantial derivation framework could avoid this sprawling scope by focusing instead on the defendant's commercial end, rather than the R&D means along the way. Under that test, just as under the current one, the defendant would be liable if it winds up exploiting a similar product. [144] It would not be liable, however, if it develops something sufficiently different (defining that sufficiency is an issue that we take up in the next two sections).

That redirected focus would promote healthier competition. Trade secrecy rightfully worries that others' exploitation of secrets could reduce an owner's output or induce wasteful self-help on surveillance. But merely drawing on a secret while researching other potential investments isn't yet exploitation. It's a search for something to exploit. If that search doesn't ultimately generate a similar good or method, the only potential advantage that the secret has bestowed on a would-be defendant is inspiration.

Of course, a trade-secret owner might not want to give inspiration away for free. It incurs a private cost if it strengthens or hastens its competitors' successes. We can't rule out the theoretical possibility that, at the margins, those costs would dissuade a firm from investing in socially beneficial information. But that reed is far too slim. Even under a regime that excluded intermediate uses, owners would still continue to wield a legal right over how others ultimately extract value from secrets. We doubt that a critical mass would significantly alter its behavior simply because it couldn't also wield an equivalent right over every good idea that those secrets beget. Trade secrecy, like any other IP regime, need not and should not aspire to let owners capture every ounce of spillover value that they generate.[145]

Adopting a proposal that effectively eliminates use of negative know-how as a basis for liability may sound like a radical shakeup. Nevertheless, our proposal is actually more modest than it might seem. It doesn't demand tossing out negative know-how as an eligible category of trade secrets altogether. Claims based on wrongful ac-

144. *See, e.g.*, Proline Products, LLC v. McBride, 324 P.3d 430, 433 (Ct. Civ. App. Okla. 2014) (holding the defendant liable for misappropriating a secret formula for an asphalt cold-patch additive, despite his efforts to design around it, because he had merely swapped in an ingredient "with the same characteristics" as the one he had taken out).

145. *See generally* Brett M. Frischmann & Mark A. Lemley, *Spillovers*, 107 Colum. L. Rev. 257 (2007).

quisition or unauthorized disclosure would remain just as viable as they ever were. Only an alleged misappropriation of negative know-how based *solely* on use would fail. Even under current law, few if any cases have involved a successful misappropriation claim based on such a theory.[146] And before the UTSA, courts typically did not consider negative know-how to be a trade secret at all.[147] The viability of a standalone claim for using negative know-how has thus remained largely untested.[148] Given that lay of the land, we don't see the elimination of these claims as unsettling much in the way of eligible subject matter. At the very least, we think it worth the bargain of freeing potential defendants from the unrealistic expectation that they must repeat known failures in order to continue work on a particular line of research.[149]

One argument in favor of trade secrecy's current strictness, which Lemley has recently advanced, is that misappropriation is harder to detect than other forms of IP infringement and so is bound to go underenforced.[150] Adequate deterrence, the theory goes, would therefore demand that a plaintiff be able to target not only direct exploitation but also downstream adaptations that benefited in some way from familiarity with the secret at the start.

We agree that underenforcement can be a problem.[151] But we're skeptical that

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146. Cases involving negative know-how almost always involve some accompanying positive know-how as well. We have yet to find any published case in a UTSA jurisdiction where a misappropriation claim was based solely on the use of negative know-how.

147. *See* Graves, *supra* note 143, at 394 & n.11 ("[M]ost courts ruling in trade secret cases from the period before the Uniform Trade Secrets Act was adopted, and in those states which today still apply the 1939 Restatement, refused to recognize trade secrets in negative know-how or to hold defendants liable for not repeating a plaintiff's mistakes.").

148. Moreover, on the federal side, the DTSA's "use in interstate commerce" requirement that brings the law within Congress' Commerce Clause power, 18 U.S.C. § 1836(b)(1), arguably makes negative know-how ineligible for protection as a constitutional matter. *See* Sandeen & Seaman, *supra* note 36, at 894 ("[T]here does not seem to be any basis to argue that so-called 'negative information' can be protected under the DTSA, as negative information is not normally in use.").

149. *Cf.* Novell, Inc. v. Timpanagos Research Group, Inc., 46 U.S.P.Q.2d 1197, 1216–17 (Utah Dist. Ct. 1998) (preliminarily enjoining the defendants under an inevitable disclosure theory because "it is inconceivable to believe that if [they] are designing a product similar to [the plaintiff's] that they ever would start down any of the blind alleys that they already know won't work. No one is going to spend money trying that which they already know will end in failure.").

150. Lemley, *supra* note 131, at 266–67.

151. We're unsure, though, whether it's a significantly bigger problem than underenforcement in copyright, where enforcement is also notoriously difficult. *Cf.* Roger D. Blair & Thomas F. Cotter, *An Economic Analysis of Damages Rules in Intellectual Property Law*, 39 Wm. & Mary L. Rev. 1585, 1655–56

targeting materially different adaptations is a good solution. If the goal is to make up for unobserved violations by ramping up deterrence of any observabed violations, it's not clear why adapters as a group are the ones best suited to pay for that shortfall. Instead, policymakers could, for instance, increase the available damages for plain-vanilla, direct exploitation of the secret.[152] Indeed, trade secret law already allows courts to disgorge a defendant's unjust enrichment and to double a damages award where the defendant has acted willfully.[153] Courts might also equitably calculate damages based on a period even longer than that strictly necessary to erase a defendant's head start from the misappropriation.[154] Once the legal system has identified a class of defendants that ought to remedy a plaintiff's harms, it can modulate the severity of those remedies to mitigate any underenforcement shortfall.

It's far from obvious that adapters trying to design around the trade secret owner's entitlement should be part of that class. On the contrary, they're engaged in an innovation process that the legal system ought to encourage, and indeed does encourage when the governing IP regime happens to be copyright or patent.[155] Lemley es-

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(1998) (surmising that acts of copyright infringement are more likely to go undetected than violations of patent, trademark, and trade secret law, but acknowledging the absence of "rigorous empirical studies" and questioning the feasibility of any such study "given the impossibility of monitoring every possible act of infringement.").

152. That at least is a theory underlying copyright's statutory damages regime, which permits plaintiffs to recover more than the actual damages they'd be able to prove at trial. *See* 17 U.S.C. § 504(c); Blair & Cotter, *supra* note 151, at 1656 (conjecturing that copyright's "statutory damages rule provides a response to the potential underenforcement problem" by "provid[ing] the owner with a greater incentive to detect violations and to enforce his rights than would otherwise exist."). Relatedly, an extensive law-and-economics literature has argued that multiplied damages can reduce underdetection and underenforcement problems. *See, e.g.*, Robert Cooter & Thomas Ulen, Law and Economics 260–61 (6th ed. 2012) (arguing that "[t]he efficiency loss due to enforcement error can be offset by augmenting compensatory damages with punitive damages" that "equal the inverse of the enforcement error"); A. Mitchell Polinsky & Steven Shavell, *Punitive Damages: An Economic Analysis*, 111 Harv. L. Rev. 869 (1998) ("When an injurer has a chance of escaping liability, the proper level of total damages to impose on him, if he is found liable, is the harm caused multiplied by the reciprocal of the probability of being found liable.").

153. *See* USTA §§ 3(a) & (b); 18 U.S.C. §§ 1836(b)(3)(B)(i)(II) & (C).

154. *See* Agilent Techs., Inc. v. Kirkland, No. CIV.A. 3512-VCS, 2010 WL 610725, at *27 (Del. Ch. Feb. 18, 2010) (equitably running a lost profits calculation beyond the head-start period necessary to cover compensatory and unjust enrichment damages in order to "prevent underenforcement and to remedy the defendant's increased market share").

155. *See supra* text accompanying note 132 through note 135.

sentially acknowledges as much, qualifying any defense of trade secrecy's current approach with the important caveat that the law "should limit the reach of the fruit of the poisonous tree doctrine where the defendant's product or process is sufficiently changed from the misappropriated one."[156]

Copyright law already adopts a version of what we're proposing. In a garden variety copyright infringement case, the work that is alleged to be embodied an illicit copy is the same work that the defendant is exploiting. But sometimes the relevant copy is merely preliminary, a means toward a noninfringing end. How strictly courts scrutinize such so-called "intermediate copying" depends somewhat, like the substantial similarity standard itself, on the type of work at issue. But even at its strictest, copyright law gives such defendants an easier path than it would in a case of direct of exploitation.[157]

When the work at issue is an artistic one like a novel, play, or film, courts generally allow second comers to make undistributed copies in the course of making a noninfringing work. This categorical approach allows a writer to produce initial drafts that tread closely on a copyrighted predecessor so long as the final draft is not substantially similar to it.[158] As the Ninth Circuit once explained, merely making "working copies" is insufficient to trigger liability because "[c]opyright law's prohibition against 'copying' does not prevent a subsequent author from making photocopies to use solely as source material."[159]

An important reason for this permissiveness is that others' intermediate copying

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156. Lemley, *supra* note 131, at 269.

157. *See* Osterberg & Osterberg, *supra* note 110, § 2:7 at 2–39.

158. *See, e.g.*, Stromback v. New Line Cinema, 384 F.3d 283 (6th Cir. 2004); See v. Durang, 711 F.2d 141 (9th Cir. Cal. 1983) ("The only discovery plaintiff suggests is the production of early drafts of defendant's play on the theory they might reflect copying from plaintiff's play that was disguised or deleted in later drafts. Copying deleted or so disguised as to be unrecognizable is not copying."); Flaherty, v. Filardi, No. 03 Civ. 2167, 2007 U.S. Dist. LEXIS 69202, at *8–9 (S.D.N.Y. Sept. 19, 2007) (dismissing a copyright claim over interim drafts of a published, noninfringing final work); Walker v. Time Life Films, Inc., 615 F. Supp. 430, 435 (S.D.N.Y.1985) (refusing to consider earlier drafts of a screenplay because "the Court considers the works as they were presented to the public. . . ."); Davis v. United Artists, Inc., 547 F. Supp. 722, 724 n.9 (S.D.N.Y. 1982) ("[I]nfringement must be the film as produced and broadcast, we do not consider the preliminary scripts."); Patry, *supra* note 110, § 9:78 (observing that similarities to a defendant's interim version of a work are "irrelevant to the ultimate question of substantial similarity: that determination rests solely upon a comparison of the plaintiff's work and the defendant's final version").

159. Stone v. Perpetual Motion, LLC, 87 F. App'x 51 (9th Cir. 2004).

doesn't tend to decrease authors' incentives to invest in creating artistic works.[160] The work's commercial value depends on the expression that readers consume. Private drafts don't compete with published works. Only other published ones do.

If the work at issue is software, courts typically undertake a more exacting inquiry. In cases where a software developer has reverse engineered object code in order to develop a noninfringing program that can interoperate with it, courts have been receptive to the premise that intermediate copies along the way can trigger liability.[161] That doesn't mean, however, that these defendants will actually end up liable—just that they'll have more work to do to avoid it. Rather than handing reverse engineers an outright safe harbor, this line of cases has required them to mount a fair use defense. To prevail, a defendant must show that it needed to copy the protected code in order to access some unprotected elements within it.[162] Even in the cases employing this closer scrutiny, the outcomes for software developers accused of intermediate copying have generally been good ones.[163] The fair use analysis tries to ensure that a

160. *See, e.g.*, Osterberg & Osterberg, *supra* note 110, § 2:7 at 2-38 (2017) ("[T]he real harm to the copyright owner is not that the defendant created a draft that involved substantial copying, but that the defendant is selling his final version to the public."); Matthew Sag, *Copyright and Copy-Reliant Technology*, Nw. U. L. Rev. 1607, 1635–36 (2009) ("[I]nfringement requires at least some potential interference with the copyright owner's expectation of exclusivity. . . . Intermediate scripts that never see the light of day do not communicate the author's original expression to the public and thus cannot constitute copyright infringement.").

161. *See, e.g.*, Sega Ents. Ltd. v. Accolade Inc., 977 F.2d 1510, 1519 (9th Cir. 1992) (holding that intermediate copying of computer object code may infringe an owner's copyright "regardless of whether the end product of the copying also infringes those rights"); *see also* Nimmer & Nimmer, *supra* note 115, § 13.05 (observing that when a reverse engineer reproduces protected code, "[t]he copy generated is merely preliminary to further uses, but intermediate copying is no less an infringement of the copyright owner's exclusive reproduction right than is 'final' copying."). District courts have essentially quarantined the categorical intermediate copying defense to artistic works. *See, e.g.*, Eplanade Productions, Inc. v. The Walt Disney Co., 17 Civ. 2185(C.D. Cal. Nov. 8, 2017) (finding itself "unable to locate a single case in which the Sega 'intermediate copying' theory has been extended to impose liability based upon the copying of nonsoftware-related work" in the course of creating a dissimilar work, and therefore rejecting an infringement claim over preliminary versions of a screenplay); Quirk v. Sony Pictures Ent'mt, No. C. 11-3773 RS, 2013 WL 1345075, at *6 (N.D. Cal. Apr. 2, 2013) (refusing to extend intermediate copying liability to cases "involving alleged copying of books, scripts, or literary characters" rather than code). For a detailed comparison of these two lines of cases, see Osterberg & Osterberg, *supra* note 110, § 2:7 at 2-38.

162. *See, e.g.*, *Sega*, 977 F.2d at 1519.

163. *See, e.g.*, *id.*; Ticketmaster Corp. v. Tickets.com, Inc., No. 99 Civ. 7654, 2000 WL 1887522, at *3 (C.D. Cal. Aug. 10, 2000), *aff'd*, 2001 WL 51509 (9th Cir. Jan. 22, 2001); *cf.* Bateman v. Mnemonics, Inc., 79

defendant's interim copies aren't enabling direct competition in the plaintiff's primary market, and often enough they aren't.[164]

Putting it all together, whether through a carve-out from the prima facie infringement standard at the front end of a case or through fair use at the back end, copyright law is generally tolerant of internal-facing derivatives that form the launching pad for public-facing originals.[165] A copy that might have been otherwise actionable becomes benign when it generates subsequent creation and never itself enters into the plaintiff's markets.

The same principle should apply in trade secrecy cases. Unfortunately, courts can't pay such close attention to the defendant's final product if they are going to base the liability decision exclusively on the defendant's process of developing it. To make room for such product-to-product comparisons, courts must tolerate internal uses of another's trade secrets when the result ends up different enough—even if that use helps the defendant along the way.

F.3d 1532, 1539 n.18 (11th Cir. 1996) (endorsing this approach); Atari Games Corp. v. Nintendo of Am., Inc., 975 F.2d 832, 843, 24 U.S.P.Q.2d 1015 (Fed. Cir. 1992) (acknowledging that "[w]hen the nature of a work requires intermediate copying to understand the ideas and processes in a copyrighted work, that nature supports a fair use for intermediate copying," but nevertheless rejecting the defendants' fair use argument because they had "purloined" the copy that they had reverse engineered); *see also* Sag, *supra* note 160, at 1638 ("[I]n the case of computer software, the intermediate copying required for reverse engineering has invariably been found to constitute fair use."). Contrast these cases with *DSMC Inc. v. Convera Corp.*, 479 F. Supp. 2d (D.D.C. 2007), a rare example of a litigated case where intermediate copying of code failed the fair use test. The defendant copied the plaintiff's database schema in order to write scripts that would migrate the data into its own competing product. *Id.* at 83. Because the copying was performed by a "direct competitor" that "wanted to create a product similar to [the plaintiff's] that contained many of the same features," the court refused to deem it fair use. *Id.*

164. As Matthew Sag has argued, a focus on commercial value can explain copyright's different treatment of scripts and software. *See* Sag, *supra* note 160, at 1636–38. Code, unlike literary texts that communicate directly to an audience, derives its value from how it enables machines to function. *See* Pamela Samuelson et al., *A Manifesto Concerning the Legal Protection of Computer Programs*, 94 Colum. L. Rev. 2308, 2316 (1994). Noncommunicative uses of software can threaten real market harm to a copyright owner in a way that noncommunicative uses of literature cannot.

165. *Cf.* Lemley, *supra* note 131, at 260 (describing copyright law's rejection of a "fruit of the poisonous tree" approach insofar as it "goes out of its way to treat even . . . intermediate use as non-infringing in many circumstances if it results in the production of a non-infringing work.").

B. Materiality

Once courts are focused on the defendant's product instead of intermediate research steps, what should they be looking for? Here, again, we think that current case law is misfiring. It cares too much about the fact that a defendant used *some* elements of the plaintiff's secret and not enough about the importance of the particular elements used. What's missing is a materiality filter.

In theory, the Restatement's substantial derivation standard exempts a defendant's adaptations when the contribution of a plaintiff's trade secret is "slight." But as discussed in Part I, a number of courts have essentially treated the universe of slight derivations as a null set.[166] They impose liability on defendants who were exposed to the trade secret without considering whether they had incorporated only a trivial aspect of it or something that could have been easily recreated from public-domain materials.

Substantial derivation shouldn't just be a question of whether but also how much. Simply copying *something* from the trade secret as a factual matter shouldn't automatically require liability as a legal matter. In cases like *Smith, Rohm & Hass*, and *Affiliated Hospital Products*, the defendant had all but lost the case after admitting the fact of use—even though much (or all) of the information used was publicly available and thus unprotectable.[167] What's more, the handful of cases that have actually asked "how much?" have focused narrowly on quantitative similarity, never specifying why particular quantities ought to matter. Cases such as *Bishop, Reingold*, and *Dresser* recite numerical metrics as a proxy for materiality—the number of components in a process or feet in the length of a boat hull.[168] But they don't tell us anything qualitative. How many feet of a boat hull is substantial, anyway? Numbers alone, missing a factual context for assessing what the numbers mean, can't answer whether the defendant took a significant feature of the plaintiff's trade secret.

In order to evaluate that qualitative context, courts should start by dissecting the plaintiff's secret into protectable and unprotectable elements.[169] Trade secret subject

166. *See supra* section I.B*; see also* Graves, *supra* note 143, at 404 ("There appear to be no cases applying the [Restatement's] modification rule but finding that a defendant's modifications were sufficiently transformative to avoid liability.").

167. *See supra* text accompanying note 56 to note 62.

168. *See supra* text accompanying note 76 to note 83.

169. While the question of whether information qualifies as a trade secret is typically one of fact, there are

matter, while broad,[170] excludes information that is described in prior publications, generally known within an industry, readily ascertainable from commercialized products,[171] or attributable to an employee's prior skill and expertise.[172] Some of these unprotectable elements, like published information, may be easier to identify and extricate than others.[173] But all have been excluded from trade secrecy's purview in order to promote cumulative innovation and protect employee mobility.[174] Courts under-

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still "instances where information may be deemed not to be a trade secret as a matter of law." MILGRIM, *supra* note 29, §15.01. As the line between protectable and unprotectable information can be "extraordinarily difficult . . . to draw," the task of dissection is appropriate for courts, not juries. Lemley, *supra* note 119, at 741.

170. *See* UTSA § 1(4) (establishing that trade secret subject matter includes "a formula, pattern, . . . or process"). Because trade secret law encompasses processes and methods while copyright does not, where a plaintiff brings both copyright and trade secret claims related to software, the copying of more abstract levels may be permissible under the former but not the latter. *See, e.g.*, GlobeRanger Corp. v. Software AG USA Inc., 836 F.3d 447, 489 (5th Cir. 2016) (explaining that trade secret law would prohibit the copying of "broader levels" of abstraction, such as "the organizational structure of a software system").

171. UTSA § 1(4) (defining "trade secret" to exclude "information . . . generally known to, and . . . readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use"); 18 U.S.C. § 1839(3) (same).

172. *See, e.g.*, Rohm & Haas Co. v. Adco Chemical Co., 689 F.2d 424, 432 (3d Cir. 1982) ("[T]he general knowledge, skill and experience gained by an employee during his employment cannot be claimed as a trade secret by his employer"); Micro Consulting, Inc. v. Zubeldia, 813 F. Supp. 1514 (W.D. Okla. 1990), *aff'd mem.*, 959 F.2d 245 (10th Cir. 1992) ("[A] person has the right to use ideas generally known . . . and may combine with such general knowledge his own abilities and his knowledge of the customs of the market, the methods of obtaining business, and all other factors which affect his particular fields and to compete with his former employer."). Nor does trade secret protection prevent the defendant from learning the same information from an unrelated third party—for example, through a separate licensing agreement. *See* Penalty Kick Mgmt. Ltd. v. Coca Cola Co., 31 F.3d 1284, 1294 (11th Cir. 2003).

173. Finding published information, such as patents, may be fairly straightforward. But finding information that is tacit or readily ascertainable from inspecting commercial products often requires further expert testimony and guidance—an inquiry complicated by legal uncertainty over what is or isn't "readily ascertainable." *See, e.g.*, Celeritas Tech v. Rockwell Int'l Corp. 150 F.3d 1354, 1358 (Fed. Cir. 1998) ("California law seems somewhat unsettled regarding whether a trade secret enters the public domain when it is 'readily ascertainable' or whether it must also be 'actually ascertained' by the public."). Disentangling a departing employee's skill and expertise from a protectable trade secret can be particularly cumbersome for courts. *See, e.g.*, RESTATEMENT (THIRD), *supra* note 5, § 42 cmt. d (listing cases "illustrating the difficulties inherent in distinguishing the general skill and knowledge of former employees from the trade secrets of a former employer").

174. *See supra* section I.A.

mine that policy goal by reinserting at the misappropriation stage what has been withheld at the protectability stage.

In cases where there are few protectable elements to begin with, a materiality filter would screen out claims unless the trade secret and the defendant's product bore an especially high degree of similarity to each other. Such cases will typically involve secrets covering combinations or compilations, where the only protectable aspect is the precise selection of publicly known information. Requiring fact finders to ask whether the defendant actually put that selection to use would prevent plaintiffs from effectively laundering public-domain information into exclusivity by incorporating it into a compilation.[175]

A materiality filter is particularly important given trade secrecy law's low threshold for establishing validity. The doctrine imposes no real novelty or originality requirement, encompassing almost any information with potential commercial value that a putative owner can keep secret.[176] This is why even a confidential compilation of publicly known information could be protected.[177] A low validity threshold in-

175. *See, e.g.*, Continental Data Sys., Inc. v. Exxon Corp., 638 F. Supp. 432, 442–43 (E.D. Pa. 1986) (finding that a sales manual narrowly qualified as a trade secret, even though it was a combination of publicly available materials, because the plaintiff's unique "decisions to include and exclude elements from a larger pool of data . . . . may contain a sufficient degree of novelty, *however slight,* to be excluded from general knowledge," yet then assessing the defendant's use of any "*information contained in* the sales manual" rather than use of the exact combination (emphasis added)); Rohm & Haas Co., 689 F.2d at 432–34 (suggesting that a defendant could not use a process for making latex paint that was "practically similar" to the plaintiff's process, even though "most if not all the elements of plaintiff's process were long and widely known in the trade" and the plaintiff did not have to specifically define its trade secret during litigation). *But see* Callaway Golf Co. v. Dunlop Slazenger Gr. Americas, Inc., 325 F. Supp. 2d 457, 462 (D. Del. 2004) (focusing the use inquiry on whether the defendant had used the "unique combination" of "common known ingredients in the industry" that plaintiff claimed as its secret).

176. *See, e.g.*, BladeRoom Gr. Ltd. v. Facebook, Inc., No. 15-cv-01370, 2018 WL 514923, at *2 (N.D. Cal. Jan. 23, 2018) ("In a broad sense, a trade secret consists of any unpatented idea which may be used for industrial and commercial purposes." (citation omitted)); *see also* Varadarajan, *supra* note 23, at 1410 (comparing trade secret law's minimal substantive requirements with patent law's more rigorous ones).

177. *See, e.g.*, Restatement (Third), *supra* note 5, § 39(f) ("The fact that some or all of the components of the trade secret are well-known does not preclude protection for a secret combination, compilation, or integration of the individual elements"); Penalty Kick Mgmt. Ltd. v. Coca Cola Co., 318 F.3d 1284, 1291 (11th Cir. 2003) (observing that "a unique combination" or compilation of publicly available information may qualify as a trade secret); Sikes v. McGraw-Edison, Co., 665 F.2d 731 (5th Cir. 1982) ("[A] trade secret can exist in a combination of characteristics and components, each of which, by itself, is in the public domain, but the unified process, design and operation of which in unique

creases pressure on the infringement analysis to tailor the scope of the right to the owner's inventive contribution.[178] Too expansive a concept of actionable use risks turning the legal right into, as Lemley puts it, "a standardless, free-roaming right to sue competitors for business conduct that courts or juries might be persuaded to deem objectionable."[179] A low validity threshold combined with a similarity standard that lacks any normative criterion often pushes in the direction of overprotection.[180]

One rare trade secrecy case that followed the right route is *American Can Co. v. Mansukhani*.[181] The Seventh Circuit dissected the plaintiff's alleged secret, identified its many unprotectable elements, required heightened similarity to account for the "extremely narrow" scope of protection, and seemed to demand some level of qualitative similarity.[182] In evaluating whether the defendant's new commercial jet inks were sufficiently similar to the ones he had developed while working for the plaintiff, the court explained that prior published information, industry knowledge, and the defendant's high level of skill as a chemist significantly narrowed the scope of the plaintiff's entitlement.[183] The court cautioned that any similarity analysis comparing the products could not "lose sight of the original limitations on the plaintiff's trade secrets."[184] More than "functional similarity," it stressed, "was required where the pub-

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combination, affords a competitive advantage and is a protectable secret").

178. *Cf.* Mark A. Lemley & Mark A. McKenna, *Scope*, 57 Wm. & Mary L. Rev. 2197, 2230 (2016) ("[An] approach which focuses very little on the validity stage and treats the limiting doctrines as inputs into the infringement analysis, puts tremendous pressure on courts to tailor the scope of rights in a work at the infringement stage. As courts typically recognize, the scope of protection to which an author is entitled is supposed to match the size of her original contribution.").

179. Lemley, *supra* note 30, at 343–44; *see also* Protexol Corp. v. Koppers Co., 229 F.2d 635, 637 (2d Cir 1956) (rejecting a view of improper use that would prevent "anyone receiving a trade secret [from] thereafter experiment[ing] with the ingredients therein, even though their use for the purpose had been well known for years," because "[s]uch a result is not only unnecessary for the promotion of business morality, but offensive to the sound policy of promoting technical progress").

180. Often, though not always. As discussed previously, courts may also underprotect if they discount the qualitative importance of quantitatively small usage. *See supra* text accompanying note 81 to note 83.

181. 742 F.2d 314 (7th Cir. 1984).

182. *Id.* at 330–31.

183. *Id.* (explaining that "the scope of American Can's trade secrets was extremely narrow—the protected secrets are limited to the precise proportions of ingredients which are themselves already in the public domain" and that "Mansukhani has substantial skill, knowledge and experience in formulating commercial jet inks, [which] he is entitled to use . . . to compete against American Can").

184. *Id.* at 331.

lic information and the defendant's own knowledge confined so narrowly the scope of the valid trade secrets."[185]

A few other cases have reached similar results.[186] But given trade secrecy's lack of a coherent approach for assessing the materiality of a defendant's use, even courts that get the result right are all over the map in terms of how they get there. Unfortunately, regardless of which party wins, many trade secrecy cases recite a very broad definition of actionable use that counsels those with prior exposure to a trade secret to avoid similar research paths altogether.[187]

Once again, copyright's infringement framework provides a helpful proof of concept. In formulating the test that would eventually become copyright's modern substantial similarity standard, the Second Circuit announced in *Arnstein v. Porter* that "adequate proof . . . of copying . . . is not enough; for there can be 'permissible copying,' copying which is not illicit."[188] Copying as a factual matter does not lead to a conclusion of infringement as a legal matter.[189] The doctrine separates the inquiry into two distinct questions. One is strictly objective. It asks whether, as a matter of historical fact, the defendant actually copied anything from the plaintiff. The other is normative, assessing the significance of any copying that actually occurred.

A copyright, like a trade secret, is easy to obtain.[190] Unlike a trade secret, however, it isn't always effective against a nonliteral copyist. In many copyright cases, the

185. *Id.*

186. *See, e.g.*, *Penalty Kick*, 318 F.3d at 1292 (emphasizing that the defendant needs to use "a *substantial portion* of the secret" for liability and engaging in a process of comparison akin to analytic dissection); Callaway Golf Co. v. Dunlop Slazenger Gr. Am., Inc., 318 F. Supp. 2d 205 (D. Del. 2004) (concluding that there was no actionable "use" of plaintiff's trade secret because any commonalities between the plaintiff's and defendant's golf ball technologies related to information "commonly known in the industry" or described in prior patents); Berry v. Glidden, 92 F. Supp. 909, 912–13 (S.D.N.Y. 1950) ("[I]t is not enough that defendant used what plaintiff imparted to it in confidence. Before defendant can be restrained from, or held to account for, such use, plaintiff must further establish that he disclosed something novel to the defendant.")

187. *See supra* text accompanying note 68 to note 74.

188. 153 F.3d 154 F.2d 464, 472 (2d Cir. 1946).

189. *See* TufAmerica, Inc. v. WB Music Corp., 67 F. Supp. 3d 590, 598–99 (S.D.N.Y. 2014) (critiquing a plaintiff who had asked the court to "find qualitative significance simply because defendants have actually copied its work" because such reasoning would "improperly conflate[] factual copying and actionable copying").

190. *See* Feist Publ'ns, Inc. v. Rural Tel. Serv. Co., 499 U.S. 340, 345 (1991) (describing copyright's low threshold for protectability).

factual question of whether copying occurred is conceded altogether; what's disputed is the materiality of that copying.

As part of the normative half of the copying analysis, courts emphasize that using a fragment of a larger work won't trigger liability unless it is qualitatively significant. As the Second Circuit put it, "the quantitative analysis of two works must always occur in the shadow of their qualitative nature."[191] While a large quantity of copying will always push in favor of an infringement finding, a small quantity cannot except if it's genuinely important to the plaintiff's work.

In order to enable that assessment of qualitative significance, courts will often break down the plaintiff's work into its constituent elements and dissect its individual similarities and dissimilarities with the defendant's work. This dissective approach is most prevalent in disputes over software and other technical materials, the subject matter most analogous to what's involved in typical trade secret cases.[192] Thinking about the plaintiff's work as a combination of smaller features, rather than an abstract whole, allows a court to filter out its unprotectable features and center the similarity analysis on whatever remains.

If little protectable expression remains after dissecting the plaintiff's work, then a court may raise the similarity threshold that triggers liability. To infringe in such cases, a defendant's work must be not only substantially similar but "virtually identical" to the copyrighted work.[193] Demanding this higher degree of similarity gives a work a

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191. Nihon Keizai Shimbun, Inc. v Comline Bus. Data Inc., 166 F.3d 65, 71 (2d Cir. 1999); *see also* TufAmerica, Inc. v. WB Music Corp., 67 F. Supp. 3d 590, 596 (S.D.N.Y. 2014) ("[T]he qualitative significance prong of the substantial similarity test . . . in many ways is more important than its quantitative counterpart.").

192. *See, e.g.*, Computer Assocs. Int'l, Inc. v. Altai, Inc., 982 F.2d 693, 706–11 (2d Cir. 1992); *see also* Lemley & McKenna, *supra* note 178, at 2235 (noting that courts are most "eager" to allow dissection, rather than strictly comparing works as a whole, in software cases). But even cases dealing with more traditionally artistic works sometimes go this route as well. *See, e.g.*, Kohus v. Mariol 328 F.3d 848, 855–56 (6th Cir. 2003) (latch design drawings); Tiseo Architects, Inc. v. B&B Pools Servs. & Supply Co., 495 F.3d 344 (6th Cir. 2007) (architectural design drawings); Yankee Candle Co. v. Bridgewater Candle Co., 259 F.3d 25, 33–34 (1st Cir. 2001) (label designs).

193. *See, e.g.*, Mattel, Inc. v. MGA Entm't, Inc., 616 F.3d 904, 913–14 (9th Cir. 2010) ("If there's a wide range of expression . . . then copyright protection is 'broad' and a work will infringe if it's 'substantially similar' to the copyrighted work. If there's only a narrow range of expression . . ., then copyright protection is 'thin' and a work must be 'virtually identical' to infringe."); TransWestern Pub. Co. LP v. Multimedia Marketing Assocs., 133. F3d. 773, 776 (10th Cir. 1998) (["M]ore similarity is required when less protectible matter is at issue. Thus, if substantial similarity is the normal measure required to demonstrate infringement, 'supersubstantial' similarity must pertain when dealing with 'thin' works."

thinner level of protection, reflecting the fact its author had not contributed much original expression to it in the first place.[194] Under the banner of this "thinness" standard, copyright law goes easier on defendants who copy, say, a protected compilation of individually unprotectable facts than those who copy a novel or a painting.[195] Indeed, even in decisions that have engaged in a holistic comparison rather than a dissective one, courts have stressed that the presence of unprotectable elements requires a "more refined analysis" that ensures that the alleged similarity is "between those elements, and only those elements, that provide copyrightability to the allegedly infringed compilation."[196]

If a court assessing a trade secret claim is looking for a way to ensure that an alleged substantial derivation is actually substantial, the basics of copyright's two-sided approach is a decent fit. We really do mean the basics here. We've left out many of the flawed details of how copyright structures its materiality framework in litigation.[197] We don't think that copyright has all the right answers, but it has some. One of the most fundamental, which trade secret cases are currently missing, is that some copying is simply too insubstantial to penalize.

C. Foreseeable Markets

Even if the copied information was material to the plaintiff's project, a misappropriation defendant may be using it to compete in a very different market. In *Collelo v. Geographic Services, Inc.*, for example, the Supreme Court of Virginia held a defendant liable even though no reasonable jury could have found that the defendant

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(quoting 4 Melville B. Nimmer & David Nimmer, Nimmer on Copyright, § 13.03[A] at 13–28 (1997)); *Nihon*, 166 F.3d at 71 (concluding that where "the copyrighted work contains both original and unprotected elements, a higher quantity of copying is required to support a finding of substantial similarity than when the infringed work is wholly original").

194. *See* Balganesh, *supra* note 112, at 207–08.

195. *See* Feist Publ'ns, Inc. v. Rural Tel. Serv. Co., 499 U.S. 340, 349 (1991).

196. Boisson v. Banian. 273 F.3d 262, 272 (2d Cir. 2001) (*quoting* Key Publ'ns, Inc. v. Chinatown Today Pub'g Enters., Inc., 945 F.2d 509, 514 (2d Cir. 1991)).

197. For a taste, see, for example, Shyamkrishna Balganesh et al., *Judging Similarity,* 100 Iowa L. Rev. 269, 270 (2014) (demonstrating through lab experiments with lay jurors that knowledge of actual copying often infects fact-finders' perceptions of materiality); Samuelson *supra* note 3 , at 1827 (arguing that dissective analysis isn't used as often as it should be); Lemley *supra* note 119 at 740 (same).

had taken the secret "in order to do the work that that secret was designed for."[198] The trial court had found "no evidence whatsoever" that the parties were competing or "even doing the same work."[199] Cases like *Collelo* highlight the question whether differences in commercial usage ever matter when, in a vacuum, the products themselves are similar. The court said no.

But the common law of unfair competition, from which the particulars of trade secret law first evolved, says yes. Recovery for misappropriation requires some direct competition.[200] Outside the plaintiff's relevant markets, all competition is fair.[201]

One could conceivably argue that trade secrecy law should return to its roots by reinvigorating a direct competition requirement and then call it a day. But if one justifies trade secrets as IP incentives, as we do, then the analysis can't stop there. A relevant-markets criterion needs some specification of which markets are relevant. Unfortunately, misappropriation doctrine skips that question entirely.[202] The market in which the firm is actually operating is a good start. Were it the end as well, though, R&D investment could take a serious hit. A firm may invest in developing socially valuable information not only based on a primary commercial use that it exploits immediately, but also based on anticipated potential value in a derivative market yet to come. Deeming such revenue streams irrelevant to trade secret protection risks distorting or even eliminating those investments. Asking courts to look for competition in similar markets is thus, while necessary, still insufficient. There needs to be a framework for assessing which markets a plaintiff may even bring to the table before they

198. 727 S.E.2d 55, 62 (Va. 2012).

199. *Id.*

200. Restatement Third, *supra* note 5, § 38 cmt. c ("Appeals to the misappropriation doctrine are almost always rejected when the appropriation does not intrude upon the plaintiff's primary market. Only rarely have courts applied the doctrine to appropriations of intangible trade values for use in secondary or derivative markets.")

201. *See, e.g.*, U.S. Golf Ass'n v. St. Andrews Sys., Data-Max, Inc., 749 F.2d 1028, 1038 (3d Cir. 1984) ("[The] use of information in competition with the creator outside of its primary market [] falls outside the scope of the misappropriation doctrine, since the public interest in free access outweighs the public interest in providing an additional incentive to the creator or gatherer of information.").

202. *See* Shyamkrishna Balganesh, *"Hot News": The Enduring Myth of Property in News*, 111 Colum. L. Rev. 419, 472–73 (2011) ("Despite its avowed importance, no court has to date offered a meaningful test or approach to applying the [relevant markets] requirement. The dominant approach appears to involve courts adopting a largely intuitive understanding of both direct competition and the primary market that the parties operate in.").

can be compared to the defendant's.

In this section, we offer a rough sketch of such a framework grounded in the notion of foreseeable markets. Under our proposed standard, a defendant's adaptation of secret information should be actionable only if, as of the time of the secret's development, either the plaintiff actually foresaw, or a reasonable firm in the plaintiff's industry would have foreseen, the commercial use at issue. If not, the adaptation should be permitted.

Within the common law, a foreseeability limitation has an excellent pedigree. From tort law's proximate causation to contract law's doctrine of impossibility, courts have tried to cabin liability when an intervening event is genuinely unanticipatable.[203] The classic economic justification for these rules is that people are incentivized to act today by the subjective probabilities they assign to possible outcomes tomorrow. If someone foresees a risk of loss, she will conform her behavior to avoid it if the costs of doing so don't outweigh the risk-adjusted benefits. Law can modulate that behavior by adding costs or benefits to the equation. In the textbook negligence example, a company that might not have otherwise decided to invest in preventing loss to others would do so if the expected value of an eventual damages payout outweighs the expected value of the investment. The threat of liability thus encourages a higher level of care.[204]

People make these ex ante decisions based on the possible scenarios that they can forecast. That which cannot reasonably be predicted also cannot do much to incentivize. If a law is meant to affect individuals' cost/benefit calculations, it shouldn't need to consider future outcomes that those individuals wouldn't have considered themselves.[205]

Restricting an exclusive-rights entitlement's scope to a foreseeable range of commercial uses limits the owner's rewards to those that are genuinely likely to influence creative investments. IP protection isn't costless, of course, driving up prices for con-

203. For additional examples, see Shyamkrishna Balganesh, *Foreseeability and Copyright Incentives*, 122 Harv. L. Rev. 1569, 1594–1600 (2009).

204. *See* William M. Landes & Richard A. Posner, The Economic Structure of Tort Law 246–47 (1987).

205. *See* Balganesh, *supra* note 203, at 1592; *see also* Eric Kades, *Windfalls*, 108 Yale L.J. 1489, 1492 (1999) ("Societal capture of windfalls, by definition, does not affect incentives to engage in productive activity and therefore does not discourage effort or enterprise.")

sumers and follow-on creators.[206] If society is going to provide it, it should gain more than it gives up. Limiting owners' control to reasonably foreseeable uses helps keep these social costs no larger than they need be to facilitate creative production. Whatever private harm owners might experience by the inability to control uses they never had in mind at the time of creation, that harm shouldn't affect the initial investment decision. True, it would reduce the unexpected bonus they would gain. But as Eric Kades has observed in the taxation context, redistributing such windfalls should still leave intact private incentives to invest. "Taxing surprises," as he puts it, "cannot distort agents' economic planning."[207]

The lack of harm to upstream owners isn't a foreseeability limitation's only virtue. It also accrues social benefits downstream. Exempting unforeseeable uses sends a signal to downstream innovators to explore and exploit new markets that the owner's industry hasn't yet envisioned.[208] It steers commercial activity toward risk-taking, channeling second comers toward new adaptations of content for different audiences rather than sterilely copying the content that the public already has.[209]

This general logic applies well to trade secrets. Trade secret protection induces firms to invest in developing valuable information without engaging in as much wasteful self-help to keep that information away from competitors.[210] To perform that inducement role, the law needs to offer a carrot sufficiently large to convince firms that they'll be able to recoup their expenses. If a company is content with that carrot based on projected revenues from X number of foreseeable uses, it would still make the investment even without the extra returns from an X+1th use that it had never contemplated.

Imagine, for instance, if a high-level employee of the Coca-Cola Company de-

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206. *See, e.g.*, Yochai Benkler, The Wealth of Networks: How Social Production Transforms Markets and Freedom 35–37 (2006). One of us has argued that this second cost, in the form of diminished creative opportunities for second comers, has likely been overstated. *See generally* Fishman, *supra* note 115. Even if so, though, we agree that it's more than zero. *See id.* at 1400–1403.

207. *See* Kades, *supra* note 205, at 1494–95.

208. *See* Samuelson, *supra* note 228, at 1559–60.

209. *Cf.* Fishman, *supra* note 115, at 1397 (making a similar observation about copyright fair use's privileging of uses deemed to be "transformative").

210. *See* Lemley, *supra* note 30, 333–37 (reviewing evidence that, without legal protection, companies overinvest in keeping valuable information secret and underinvest in precontractual negotiations with potential business partners)

parted with her (legitimately acquired) knowledge of its secret formula. After studying its chemical structure, she discovers that if she combines it with other ingredients she can put it to a novel use: automotive fuel.[211] She begins selling the fuel through her new firm, prompting an immediate lawsuit. Under our proposal, a court would ask whether Coke would stand to lose any current or reasonably foreseeable segment of its market. Assuming, as we do, that the answer would be no, that employee would face no liability for her use of the formula. We think this would be a sensible result—and one that probably wouldn't occur under current law. Competing with the plaintiff is, after all, not an element of a misappropriation claim.[212] The R&D boost that the employee's knowledge gave her at the outset would be enough to support liability.

This dynamic of individual employees reaching a breakthrough unanticipated by their corporate employer has recurred in several famous examples from the history of innovation. During World War II, for instance, a researcher at Eastman Kodak was experimenting with chemicals called cyanoacrylates in order to make a clear plastic that could be used for precision gunsights. But his team scrapped the project after the substances consistently proved too sticky.[213] In 1951, the same researcher was again experimenting with the chemicals, this time for a heat-resistant polymer to cover jet airplane canopies. Again, too sticky.[214] But this time, he realized these chemicals might have some useful application in an entirely different setting: adhesives. In 1958, the product finally made it to market under the now-familiar brandname Super Glue.[215]

As it happened, the employee had remained with Kodak throughout. But what if his pathbreaking realization had come only after he had left the company, armed

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211. Is this a stretch? Maybe, but then again you might not have thought to use McDonald's fries to cure male pattern baldness, either. *See* Christina Zhao, *Chemical in McDonald's Fries Could Cure Baldness, Study Says*, Newsweek (Feb. 4, 2018, 10:01 am), http://www.newsweek.com/chemical-mcdonalds-fries-may-cure-male-baldness-study-say-799439. And for what it's worth, Coke can at least be used therapeutically in a lavage for treating gastric phytobezoars. *See* S.D. Ladas et al., *Systematic Review: Coca-Cola Can Effectively Dissolve Gastric Phytobezoars as a First-line Treatment*, 37 Alimentary Pharmacology & Therapeutics 169 (2013).

212. *See* Collelo v. Geographic Servs., Inc., 727 S.E.2d 55, 61–62 (Va. 2012).

213. *See* Barnaby F. Feder, *Making Things Stick in the Age of Plastic*, N.Y. Times (May 31, 1992).

214. *Id.*

215. *Id.* On the science behind Super Glue, see Alcohol-catalyzed Alpha-cyanoacrylate Adhesive Compositions, U.S. Patent No. 2,768,109A (1956).

with the knowledge he had acquired there about how cyanoacrylates work? Would Kodak have had a viable claim for misappropriation? Under current law, many courts would ask whether the employee's adhesives research had benefitted from his time at Kodak—and the answer would surely be yes. But asking that question risks handing the employer a windfall if it had made its investments without any expectation that it might develop a high-strength glue. We think the better question is whether a reasonable competitor in the industry would have foreseen this particular commercial application. Maybe the answer is yes (in hindsight, it sounds plain enough that sticky things should be used to stick things together). Or, then again, maybe the answer is no (after all, this employee was the first to make the connection, and even he took years to do so). But however the factual question is resolved, we think the focus should be on what a firm in Kodak's position should have seen coming.

If you prefer low-strength adhesives over high-strength ones, there's a foreseeability story for that, too. The technology we now know under the brandname Post-it Notes began as a failed experiment at 3M to make a strong glue for the aerospace industry.[216] The company's decisionmakers considered the compound useless.[217] Nevertheless, several researchers essentially went rogue and developed the product anyway because they foresaw a genuine demand for an especially weak adhesive rather than an especially strong one. Here again, though, what if they had walked after 3M told them no? If they had left the company, would they have been committing misappropriation if they continued work on adhesive bookmarks? We think the answer should depend on whether 3M's apparent lack of foresight would have been shared by its industry peers.

Similar "what if" thought experiments could be performed with the employees behind various other famous technologies, from consumer products like Play-Doh (initially developed as a nontoxic wallpaper cleaner before anyone had an inkling that it might work as a toy)[218] to drugs like Viagra (originally intended to treat angina pain before some scientists noticed that patients were experiencing erections as a side effect).[219] Because serendipity plays such a large role in innovation, technologists will

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216. *See* Pamela Cyran & Chris Gaylord, *The 20 Most Fascinating Accidental Inventions: 2. Post-Its*, Christian Science Monitor (Oct. 5, 2012), https://www.csmonitor.com/Technology/2012/1005/The-20-most-fascinating-accidental-inventions/Post-its.

217. *Id.*

218. Tun-Jen Chiang, *The Reciprocity of Search*, 66 Vand. L. Rev. 1, 42 (2013).

219. Hossein Ghofrani et al., *Sildenafil: From Angina to Erectile Dysfunction to Pulmonary Hypertension and*

continue to stumble upon new products and uses that they couldn't reasonably have predicted at the outset.[220] That unpredictability ought to cabin a trade secret's scope.

Such a foreseeability limitation isn't untested. Once again, the existing copyright infringement framework already offers a version of our proposal. Tucked into the back end of the analysis, after a plaintiff has established a prima facie case of infringement, copyright law often exempts an defendant from liability if his conduct posed no commercial harm to the plaintiff. This focus on market effects enters the picture through the fair use doctrine, a judge-made standard now codified at 17 U.S.C. § 107. Fair use is "'an equitable rule of reason' which 'permits courts to avoid rigid application of the copyright statute when, on occasion, it would stifle the very creativity which that law is designed to foster.'"[221] One of the statutory factors that courts are instructed to consider is the level of harm to the plaintiff's markets.[222] The Supreme Court has called it "undoubtedly the single most important element of fair use"[223] and "the 'most important, and indeed, central fair use factor.'"[224]

Beyond, 5 Nat. Rev. Drug Discovery 689, 689 (2006).

220. *Cf.* Sean B. Seymore, *Serendipity*, 88 N.C. L. Rev. 185 (2009).

221. Stewart v. Abend, 495 U.S. 207, 236 (1990) (internal citation omitted) (first quoting Sony Corp. of Am. v. Universal City Studios, Inc., 464 U.S. 417, 448 (1984), then quoting Iowa State Univ. Research Found., Inc. v. Am. Broad. Cos., 621 F.2d 57, 60 (2d Cir. 1980)). For fair use's origins in U.S. common law, see Folsom v. Marsh, 9 F. Cas. 342, 344–45 (C.C.D. Mass. 1841) (No. 4901).

222. 17 U.S.C. § 107(4).

223. Harper & Row Publ'ns v. Nation Enters., 471 U.S. 539, 566 (1985),

224. Stewart v. Abend, 495 U.S. 207, 238 (1990) ((quoting 4 Melville B. Nimmer & David Nimmer, Nimmer on Copyright § 13.05[A][4], at 13-182 (1978)). The Court has since softened that stance. *See* Campbell v. Acuff-Rose Music, 510 U.S. 569, 590 n.21, 591 ("The importance of this [market harm] factor will vary, not only with the amount of harm, but also with the relative strength of the showing on the other factors."). Nevertheless, lower courts still emphasize it. *See, e.g.*, Kienitz v. Sconnie Nation LLC, 766 F. 3d 756, 758 (7th Cir. 2014) (criticizing case law that overemphasizes a use's transformativeness and concluding that market harm usually should be the most important question); Author's Guild v. Google, Inc., 804 F.3d 202, 213–14 (2d Cir. 2015) (noting that "the Supreme Court has made clear that some of the statute's four listed factors are more significant than others" and quoting its reference to market harm as the most important factor); Bouchat v. Baltimore Ravens Ltd. Partnership, 619 F.3d 301, 312 (4th Cir. 2010) (similar). Many commentators, too, continue to view it as the test's linchpin. *See, e.g.*, James Gibson, *Risk Aversion and Rights Accretion in Intellectual Property Law*, 116 Yale L.J. 882, 896 (2007) (describing widespread agreement that the market-harm factor is "the most important"); Barton Beebe, *An Empirical Study of U.S. Copyright Fair Use Opinions*, 1978–2005, 156 U. Pa. L. Rev. 549, 586 (2008) (finding that within published fair use cases under the current Copyright Act, the "the outcome of the [market harm] factor appears to drive the outcome of

Which licensing markets count is a recurring question in copyright cases. Of course, whatever the defendant's challenged activity happens to be, there are always foregone royalties at stake. But it would be perverse if a copyright owner's sheer willingness to license a use would spring forth a right to control that use; were it so, every defendant would flunk the market harm part of the test.[225] Even if we wished to charge you, dear reader, for simply thinking about this Article, we wouldn't suffer an actionable harm when you do so for free.[226] Courts have therefore recognized that "not every effect on potential licensing revenues enters the analysis under the fourth factor."[227] They must somehow distinguish between uses for which a copyright owner is entitled to require a license and uses for which it isn't.

Many cases have accomplished that task by invoking a foreseeability standard something like the one we envision.[228] In these cases, the fourth factor's investigation of potential licensing revenues is limited to "traditional, reasonable, or likely to be developed markets."[229] Remote, transformative ventures, by contrast, have a stronger claim to remaining open for second comers to try. Thus, for example, an artist who plastered posters on walls as street art couldn't control a band's use of that art within

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the test," while "the outcome of the [nature of the use] factor also appears to be highly influential").

225. *See, e.g.*, Am. Geophysical Union v. Texaco Inc., 60 F. 3d 913, 930 n.17 (2d Cir. 1994) ("[W]ere a court automatically to conclude in every case that potential licensing revenues were impermissibly impaired simply because the secondary user did not pay a fee for the right to engage in the use, the fourth fair use factor would always favor the copyright holder."); Hofheinz v. AMC Productions, Inc., 147 F. Supp. 2d 127, 140 (E.D.N.Y. 2001) (noting that "if carried to a logical conclusion," the plaintiff's circular argument over lost licensing revenue "could eviscerate the affirmative defense of fair use since every copyright infringer seeking the protection of the fair use doctrine could have potentially sought a license from the owner of the infringed work."); Fromer & Lemley, *supra* note 2, at 1293 ("If IP owners are free to argue that the entire world is their market because they could demand a license fee in exchange for not suing someone who uses their work in a particular way, the market substitution test becomes circular and ultimately empty.").

226. Still, tips are always appreciated.

227. *Am. Geophysical Union*, 60 F. 3d at 929.

228. *See* Pamela Samuelson, *The Quest for a Sound Conception of Copyright's Derivative Work Right*, 101 Geo. L.J. 1505, 1521, 1559–60 (2013) (pointing out policy reasons to limit derivative-work rights to clearly foreseeable markets).

229. *Am. Geophysical Union*, 60 F. 3d at 929; *accord, e.g.*, TCA Television Corp. v. McCollum, 839 F.3d 168, 186 (2d Cir. 2016); Seltzer v. Green Day, Inc. 725 F.3d 1170, 1179 (9th Cir. 2013); Bill Graham Archives v. Dorling Kindersley Ltd., 448 F.3d 605, 614 (2d Cir. 2006); Ringgold v. Black Entertainment Television, Inc., 126 F.3d 70, 80–81 (2d Cir. 1997).

a video backdrop for a concert performance.[230] Or a company that recorded a conference call with investment analysts couldn't control Bloomberg's dissemination of the recording to its subscribers because, at the time of recording, it was unaware of whether such a licensing market existed, and the possibility of tapping into one "played no role in stimulating" its creation.[231] By contrast, a television series' producer could control the exploitation of a book of episode plot summaries where licensed book versions were already an established part of the market.[232] And a quilt's designer could control appearances of the quilt in a sitcom where she was already commonly licensing similar artwork for use in film and television.[233] The upshot is that the less predictable the defendant's commercial usage of the plaintiff's work, the less right the plaintiff has to demand permission.

To be sure, these cases have provided almost no details on how their foreseeability concept is supposed to work. Courts haven't discussed whose foresight matters, which point in time that foresight should be measured from, or how fact-finding on these questions should be structured. Copyright cases holding in both the plaintiff's[234] favor and the defendant's[235] alike tend to proclaim the standard loudly without explaining precisely why it cashes out a particular way when applied to the relevant facts. This cursoriness has prompted some copyright scholars to offer their own visions of how this doctrinal intuition could be made more analytically rigorous.[236]

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230. *See Seltzer*, 725 F.3d at 1179.

231. *See* Swatch Gr. Mgmt. Servs. v. Bloomberg LP, 756 F.3d 73, 91 (2d Cir. 2014).

232. *See* Twin Peaks Prods., Inc. v. Publ'ns Int'l, 996 F.2d 1366, 1377 (2d Cir. 1993) (rejecting a fair use defense because the books "report[ed] the plot in such extraordinary detail as to risk impairment of the market for the copyrighted works themselves or derivative works that the author is entitled to license").

233. *See Ringgold*, 126 F. 3d at 80–81 (denying the defendant's summary judgment motion).

234. *See, e.g.*, Castle Rock Ent'mt v. Carol Publ'g Gr., 150 F. 3d 132, 145–46 (2d Cir. 1998) (holding that a trivia book containing questions about the characters and plot-lines of *Seinfeld* infringed on the sitcom's copyright, without reciting any facts as to whether at that time trivia books based on fictional content customarily required a license, based on the court's assertion that the defendant was "likely to fill a market niche that [the plaintiff] would in general develop").

235. *See, e.g.*, Bill Graham Archives v. Dorling Kindersley Ltd., 448 F.3d 605, 614–15 (2d Cir. 2006) (holding that reproducing a band's concert posters and photographs in a historical anthology was not a "traditional" licensing market that the plaintiff was entitled to control, even though the defendant had paid fees to other copyright owners for their images and the plaintiff had both "established a market for licensing its images").

236. *See, e.g.*, Balganesh, *supra* note 203; Christina Bohannan, *Copyright Harm, Foreseeability, and Fair Use*,

Still, even if this bit of copyright doctrine is underspecified, the courts that invoke it are at least onto something fundamental. Just as negligence doctrine has no economic need to make a defendant internalize the costs of an unanticipatable loss, copyright doctrine has no economic need to allow a plaintiff to internalize the benefits of an unanticipatable gain. It lets owners control exploitation of their works both in their primary markets and in ancillary markets that are "traditional, reasonable, or likely to be developed."[237] When applied properly, that standard serves as a gatekeeper that withholds exclusivity in markets that weren't objectively foreseeable at the time the author decided to invest in making the work.[238]

In the remainder of this section, we try to fill in some of the practical details for how a foreseeability limitation should work in trade secret cases. First, though, we pause to consider two potential objections to the entire enterprise. One possible argument against a foreseeability limitation concerns entrepreneurs who expect the unexpected. Maybe, the theory would go, some innovators are incentivized not only by the revenue streams that they foresee but also by the expectation that they will be able to capture even those that they can't foresee—untethered to any particular industry trend or forecast.[239]

If such indiscriminate optimism for the future does provide an incentive, however, it's likely to be weak. Innovation is already beset by all sorts of technological and financial uncertainties.[240] Most paths in scientific research turn out to be dead ends, and the few promising ones that emerge often face obstacles to successful commer-

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85 Wash. U.L. Rev. 969, (2007).

237. Bill Graham Archives v. Dorling Kindersley Ltd., 448 F.3d 605, 614–15 (2d Cir. 2006) (quoting Am. Geophysical Union v. Texaco, Inc., 60 F.3d 913, 930 (2d Cir. 1994)) (internal quotation marks omitted).

238. *See* Bohannan, *supra* note 203, at 1019 ("Clearly, these courts are attempting to limit liability to foreseeable markets, which are the markets most likely to influence an author's decision to create a copyrighted work."); Justin Hughes, *Copyright and Its Rewards, Foreseen and Unforeseen*, 122 Harv. L. Rev. F. 81, 90 (2009) (comparing this test to a foreseeability inquiry); Samuelson, *supra* note 228, at 1559 (concluding that the dominant rationales for granting copyright owners control over derivatives apply only to foreseeable markets).

239. The Supreme Court accepted a version of this argument when it upheld Congress' retroactive extension of copyright's duration for already-existing works, reasoning that authors could have been incentivized both by the existing term length and by a prediction that Congress would extend it at some indeterminate future point. Eldred v. Ashcroft, 537 U.S. 186, 215 (2003).

240. *See* Robert Merges, *Intellectual Property Rights and Bargaining Breakdown: The Case of Blocking Patents*, 62 Tenn. L. Rev. 75, 101(1994).

cialization. Given the gauntlet of contingencies, the ability to control entirely unforeseeable future markets amounts to a lottery ticket whose award is simply another lottery ticket. The marginal incentive effect is probably minimal.[241]

That's not to say that for-profit firms don't ever engage in basic, exploratory science—though in recent years it's become rarer.[242] Even when they do, however, they tend to be motivated by more than just an expectation that their early discoveries will remain entirely proprietary. On the contrary, corporate scientists working on basic research have often published their results for the world to see.[243] There may be good financial reasons to do so. Secret or not, such in-house research can give a firm a leg up in developing its own commercial products downstream.[244] It can also help with what economists Wesley Cohen and Daniel Levinthal dubbed "absorptive capacity," the firm's ability to understand and exploit technological developments from the external environment.[245] To the extent that secrecy isn't already driving the marginal dollar of private-sector investment in basic science, limiting trade-secret scope to

241. *See id.*; Balganesh, *supra* note 203, at 1619–20. As Michael Meurer and Craig Nard note in the doctrine-of-equivalents context, while an inventor could in theory be incentivized by some "aggregate probability" of many improbable technological developments, "[t]here is no statistical evidence suggesting this is a serious problem," and "case law and the history of technology" suggest that "few inventors have much to fear." Michael J. Meurer & Craig Allen Nard, *Invention, Refinement and Patent Claim Scope: A New Perspective on the Doctrine of Equivalents*, 93 Geo. L.J. 1947, 1998 (2005).

242. *See* Ashish Arora et al., *The Decline of Science in Corporate R&D*, 39 Strategic Mgmt. J. 3 (2018) (finding that corporate labs increasingly focus on developing existing knowledge and commercializing it, rather than creating new knowledge).

243. *See, e.g.*, Ashish Arora et al., *Back to Basics: Why Do Firms Invest in Research?*, NBER Working Paper No. 23187, Nov. 6, 2017, at 5, https://www.nber.org/papers/w23187. Of course, there are exceptions, though we think they tend to prove the rule. One of the most notable one as of this writing is Google's top-secret "Calico" project, a biotech venture focused on understanding and reversing aging. *See* Antonio Regalado, *Google's Long, Strange, Life Span Trip*, MIT Tech. Rev. (Dec. 15, 2016), https://www.technologyreview.com/s/603087/googles-long-strange-life-span-trip; Julia Belluz, *Google is Super Secretive About its Anti-aging Research. No One Knows Why*, VOX (Apr. 28, 2017, 2:35 pm), https://www.vox.com/science-and-health/2017/4/27/15409672/google-calico-secretive-aging-mortality-research.

244. Arora et al., *supra* note 243, at 2 (collecting data linking patents to scientific publications matched to firms and concluding that "while spillovers might cause firms to underinvest in research, firms would still invest in research if they are able to use it internally").

245. *See* Wesley M. Cohen & Daniel A. Levinthal, *Absorptive Capacity: A New Perspective on Learning and Innovation*, 35 Admin. Sci. Q. 128 (1990); Wesley M. Cohen & Daniel A. Levinthal, *Innovation and Learning: The Two Faces of R&D*, 99 Econ. J. 569, 569 (1989).

foreseeable markets wouldn't significantly alter the playing field.

A second argument against this legal intervention concerns the viability of licensing markets. If the defendant has indeed appropriated something material, why not simply ask that she take out a license in order to produce her modified product? Why, in other words, wouldn't originator and adapter reach a Coasean bargain regardless of who receives the initial entitlement? Perhaps, the argument might go, it would be simpler to assign the originating firm the rights over a wide range of markets—even ones that a court might ultimately deem unforeseeable at the outset—rather than divvying those rights up through a messy, fact-intensive investigation.[246] An efficient licensing market would ensure that second comers could pursue innovative ways to exploit the secret, even if they have to pay a portion of their returns in order to do so.

A standard rebuttal to such arguments in the IP literature is to emphasize the costliness of transacting over rights in intangible information.[247] We agree that impediments to efficient licensing are often present, but we think they are particularly strong in the world of trade secrets. In patent law, at least, an improver of an underlying, patented technology is entitled to a separate patent on the improvement. Because practicing the improvement patent usually means infringing the claims of the

246. Such an argument would echo Edmund Kitch's prospect theory of patents, which posited that it is socially beneficial to issue broad patent rights in the early stages of technical development, not so much to encourage invention upstream but to encourage efficient use and commercialization downstream. *See* Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & Econ. 265, 276 (1977). The theory has proven controversial. *Compare* Lemley, *supra* note 3, at 1045–46 (arguing that the theory requires assuming "that information is perfect, all parties are rational, and licensing is costless"), *with* John F. Duffy, *Rethinking the Prospect Theory of Patents*, 71 U. Chi. L. Rev. 439 (2004) (arguing that the patent system's prospect features are important because they channel rivalry in ways that maximize the social benefits from the patent monopoly).

247. *See, e.g.*, Michael W. Carroll, *One Size Does Not Fit All: A Framework for Tailoring Intellectual Property Rights*, 70 Ohio St. L.J. 1361, 1393 (2009) ("Most commentators agree that difficulties in valuing patents and copyrights raise transaction costs to the point that allocative efficiency will depend upon the subject matter, scope and duration of intellectual property entitlements."); Frischmann & Lemley, *supra* note 145, at 275–76 (2007) ("Search, identification, and transaction costs are much greater with IP than they are with land or goods. . . . Once we admit that we live in a world rife with transaction costs, we must also admit that both design and allocation of rights matter. This is especially true of IP."); Lemley, *supra* note 3, at 1054–56 (observing that "while the parties ideally would base the cost of a license on the value of the right licensed, that value will likely be difficult to determine accurately in the case of unique goods like intellectual property rights" and the "difficulty of valuing both original inventions and improvements, may also prevent bargaining parties from coming to terms").

original, the improver must first obtain a license from the original patentee. The original patentee, meanwhile, cannot practice the improvement without the improver's permission. This "blocking patents" scenario encourages the parties to enter a cross-licensing agreement, each armed with valuable consideration to offer the other.[248]

Trade secrecy, by contrast, offers downstream adapters no real bargaining chip to bring to the negotiating table. Even if they could assert their own trade secret protection over their modifications, it would likely mean little to the originator, who might just as well be able to develop the same information in-house.[249] Realistically, they would have only the value of the modifications themselves, but of course they can't disclose a modification without handing it to the trade secret owner unencumbered. And the original trade secret owner can't value the modification without knowing what it is. This predicament, Kenneth Arrow's famous information paradox, can prevent the two sides from even understanding what they would be bargaining over—let alone what the right bargain would be.[250]

Even if this paradox could be overcome, the typical trade secret licensing scenario is rife with noneconomic reasons for bargaining breakdown. It's hard enough trying to make a deal with your own competitors.[251] Now imagine if that

248. *See* Lemley, *supra* note 3, at 1052 ("[B]locking patents provides just such a bargaining mechanism. Improvers have an incentive to invest in research even in the shadow of an original invention, since they can obtain a patent on their improvement. And the fact that an improvement patent gives them some real bargaining power also provides them with an incentive to come to the bargaining table, and indirectly, an incentive to invest in improvement in the first place."); *cf.* Katherine J. Strandburg, *Patent Fair Use 2.0*, U.C. Irvine L. Rev. 265, 298 (2011) (theorizing that an expectation of blocking patents bringing upstream and downstream innovators to the bargaining table has led to doctrinal obsolescence of the reverse doctrine of equivalents, which exempts substantial improvers from infringement liability altogether).

249. A blocking patent, by contrast, gives the downstream inventor a good bargaining position precisely because it would foreclose any subsequent development, even if done independently. No trade secret can do that.

250. Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, *in* The Rate and Direction of Inventive Activity: Economic and Social Factors 609, 614–16 (1962). To some extent, all licensing negotiations over trade secrets suffer from this problem. *See* Pooley, *supra* note 4, at 6-44 (noting that a potential licensee may be reluctant to expose employees who are best equipped to assess the licensor's technology for fear that "exposing them to the secrets of the prospective licensor might taint them and engender subsequent litigation if the technology ultimately is developed in house."). For more on how Arrow's information paradox can play out in IP licensing generally, see Lemley, *supra* note 3, at 1051.

251. *See* Lemley, *supra* note 3, at 1061 ("Corporate intellectual property owners may refuse to license patent rights to a competitor not because there is anything wrong with the licensing deal, but simply because

competitor has hired away one of your star employees, who is working very hard to enrich them, quite possibly at your expense. The success or failure of licensing negotiations in the world of mobile talent can be driven by feelings of betrayal or anger just as much as it can be by dollars and cents.[252] To take a notorious example, the plaintiff in one of modern trade secret law's most famous cases, *Pepsico, Inc. v. Redmond*,[253] was driven not by concerns over misappropriation but by indignation that a rival could raid its employees—and that its employees might prefer a competitor.[254] However great the likelihood of bargaining breakdown in other areas of IP, noneconomic factors in common trade secrecy scenarios can make things worse.

Thus far, this section has presented the general case for cabining trade secrecy's substantial derivation standard to reasonably foreseeable markets. In the two subsections below, we address two subsidiary, doctrinal-design questions that this standard would raise: (1) whose foreseeing counts? and (2) as of which moment in time? As we explain, the best version of this test would be based on what the plaintiff could have foreseen, or should have foreseen based on trends and developments within its industry, as of the date the trade secret was first developed.

1. Whose Foresight?

Once trade secrecy can settle on the right questions to ask, it needs to decide who should be answering them. Jeanne Fromer and Mark Lemley refer to this decision as IP infringement's choice of "audience": from whose perspective should factfinders conduct a similarity assessment—an average layperson, a technical expert, a consumer from the intended demographic, or perhaps someone else entirely?[255] For

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the proposed licensee is a competitor.").

252. *Cf., e.g.*, Proline Products, LLC v. McBride, 324 P.3d 430 (Ct. Civ. App. Okla. 2014) (describing estrangements and reconciliations in management of secret formula within a family business, ultimately ending in misappropriation).

253. 54 F.3d 1262 (7th Cir. 1995).

254. *See* Alan Hyde, *The Story of* PepsiCo, Inc. v. Redmond*: How the Doctrine of Inevitable Disclosure of the Trade Secrets of Marketing Sports Beverages Was Brewed*, *in* Employment Law Stories 117, 125 (Samuel Estreicher & Gillian Lester eds., 2007)

255. *See generally* Fromer & Lemley, *supra* note 2. The authors do not mention trade secrecy except in a footnote that suggests that courts in these cases seem to be employing a "reasonable competitor" standard. *Id.* at 1254 n.7. As we discuss in this section, we certainly agree that putting oneself in a competitor's shoes is a worthy goal in trade secrecy cases. But as a description of current judicial

trade secrets, a commercial foreseeability test should be measured from the perspective of reasonable competitors within the plaintiff's industry. That is, courts would ask whether the plaintiff actually knew, or should have known based on industry trends, that its secret was likely to be exploited in the manner that the defendant had chosen.

On the standard account, IP rights are meant to insulate creative investment from potential market harms. And to figure out what's going to happen in the marketplace, fact-finders need to channel the views of the consumers who comprise it. It thus makes sense to think about IP scope from a commercial perspective.[256]

In cases where the secret is embodied in a retail product, that perspective is essentially the end consumer's. The protected information is baked directly into the goods for which consumers are paying, much the same as a patented toaster or a copyrighted romance novel. But trade secrets, likely more so than any other form of IP, often aren't directed at end consumers. Instead, they frequently derive their commercial value from internal use within the firm. A proprietary manufacturing method might help get goods to market more cheaply, but the end user isn't interested in the method. Likewise, a customer list might enable enough sales to justify the years of business negotiations and relationship-building that underlie it, but none of those customers is purchasing the list.

For this reason, when it comes to market harm in trade secrecy cases, we think that a consumer lens will frequently end up beside the point. For trade secrets that are exploited purely internally, the hypothetical market demand that matters comes not from the firm's customers but from its competitors. When such a trade secret is at issue, courts will need to ask whether the competitor's method of exploitation is a good substitute for the owner's method.

Of course, a particular plaintiff might have more specialized knowledge that

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practice, we fear that the authors may be giving courts too much credit. In our survey of trade secret cases, we found almost no suggestion that judges had a particular vantage point in mind for making similarity assessments.

256. *See* Fromer & Lemley, *supra* note 2, at 1290–91. Fromer and Lemley also argue that infringement liability should require a similarity finding from the perspective of technical experts, not just of consumers. *Id.* at 1286–90. In their framework, however, those experts enter the analysis through improvement doctrines (like transformative use in copyright or the reverse doctrine of equivalents in patent) in order to ensure that an IP entitlement's scope doesn't sweep in others' radical advances. The role of such improvements in trade secrecy doctrine has been discussed elsewhere and lies beyond our scope here. *See supra* note 23.

gives it better foresight than do its industry peers. In such cases, the plaintiff should not be penalized just because the rest of the field hasn't yet caught up. Our proposal of tying foreseeability to the reasonable consumer or competitor is meant to be a floor. If the plaintiff knows more and can therefore forecast a wider range of potential markets, it should get the benefit of a correspondingly larger scope. In this sense, our proposal is the mirror image of the black-letter negligence rule that "[i]f an actor has skills or knowledge that exceed those possessed by most others, these skills or knowledge are circumstances to be taken into account in determining whether the actor has behaved as a reasonably careful person."[257] Just as superior foresight expands the boundaries of a defendant's duty in a negligence case, so too should they expand the boundaries of a plaintiff's entitlement scope in an infringement case. A plaintiff should receive that expanded scope if it can produce contemporaneous evidence showing its efforts to enter into a market that would otherwise seem remote. Originating firms would thus avoid being penalized for staying ahead of the curve. Indeed, this standard may incentivize them to get even further ahead than they otherwise would.[258]

257. Restatement (Third) of Torts: Liab. for Physical & Emotional Harm § 12 (2010); *see also, e.g.*, Everett v. Bucky Warren, Inc., 380 N.E.2d 653, 659 (Mass. 1978) (holding a hockey coach to higher standard of care because he had acquired substantial experience and knowledge); Toth v. Cmty. Hosp. at Glen Cove, 239 N.E.2d 368, 372–73 (N.Y. 1968) ("[A] physician should use his best judgment and whatever superior knowledge, skill and intelligence he has. Thus, a specialist may be held liable where a general practitioner may not."); Osborne v. Montgomery, 234 N.W. 372, 380 (Wis. 1931) ("If the actor in a particular case in fact has superior perception or possesses superior knowledge, he is required to exercise his superior powers in determining whether or not his conduct involves an unreasonable risk of injury to the interests of another . . . .").

258. One possible objection is that firms might be perversely incentivized to invest in developing new knowledge only to warehouse it—not to use it—just for the sake of expanding their rights' scope. We suspect, however, that any such incentive wouldn't change actual research trajectories except at the extreme margin. Firms likely have so many demands on their R&D resources that they wouldn't invest in projects whose only forecasted benefit is expanding an existing trade secret's scope in entirely unknown directions. In any event, if our suspicion turns out to be wrong, policymakers could consider requiring some affirmative use of the secret in order to achieve protection. That addition, however, would require diverging from the UTSA, which grants protection to used and unused information alike. *See* Eric R. Claeys, *The Use Requirement at Common Law and Under the Uniform Trade Secrets Act*, 33 Hamline L. Rev. 583, 584 (2010); Varadarajan, *supra* note 41, at 392–93.

2. Foreseeability as of When?

Introducing foreseeability to the misappropriation analysis requires a choice of timing. Should the the range of reasonably anticipatable markets be assessed from the time when the plaintiff first developed the secret information, or instead from when the alleged misappropriation first occurred?

We think the earlier point in time makes better sense. If trade secret protection is meant to encourage the development of socially valuable information, its foreseeability analysis should be tied to the point in time when an owner decides to invest in that development.[259] That moment—the decision whether to pursue a project or not, to spend more or less on it, or to prioritize it now or later—is when the law's incentive effects actually matter.

Of course, R&D isn't an owner's only expense over the life of a trade secret. Even after the information has come into existence, owners must make continual investments in guarding its secrecy. If they don't, the legal protection ceases to exist. But trade secret law doesn't seek to promote these continued secrecy investments for their own sake. It requires them, rather, as a signaling device that the secrets at issue are valuable enough to merit legal protection.[260] Indeed, most commentators would think society better off if information were shared freely. As a result, while trade secrecy is rightfully concerned with subsidizing R&D in the first instance, it shouldn't be concerned with separately subsidizing these secrecy investments downstream. So long as would-be owners see enough value in trade secrecy protection over the mar-

259. *Cf.* Balganesh, *supra* note 203, at 1588–89, 1603 (arguing in favor of a foreseeability filter in copyright that "would require a plaintiff to establish that the defendant's copying was objectively foreseeable at the time of creation" because post-creation considerations "bear little connection to the idea of creator incentives"). On this temporal point, we part ways from the copyright model, which generally assesses a market's foreseeability as of the time of infringement. *See id.* at 1589 ("Courts have . . . based the determination on plaintiffs' post-creation ability, motive, interest, or expectation to enter a certain market — but never on their ex ante incentive in creating the work . . . .").

260. *See, e.g.*, Rockwell Graphic Sys. v. DEV Indus., 925 F. 2d 174, 179 (7th Cir. 1991) (observing that trade secrecy requires owners to take reasonable precautions because, if an owner had "expended only paltry resource" on preventing a secret "from falling into the hands of competitors . . . why should the law, whose machinery is far from costless, bother to provide [it] with a remedy? The information . . . cannot have been worth much if [the owner] did not think it worthwhile to make serious efforts to keep the information secret."); *see also* Varadarajan, *supra* note 41 (describing various rationales for this requirement).

kets that are reasonably anticipatable at the point of development, they will make the investments that the law cares about. Whether they choose later on to continue investing in secrecy is secondary.

Identifying that point in time will probably be easier for some kinds of secrets than for others. For technological information, patent law provides a doctrinal template. Much like the assessment of a patentee's date of invention, the date of a trade secret's creation would correspond to the date when a device or process incorporating the secret was successfully reduced to working form.[261] For business information like customer lists, the answer is less clear. Such information may be constantly evolving, leaving a single date of creation harder to deduce. Ultimately, however, we aren't nearly as concerned about business-information cases because we suspect that a colorable foreseeability argument is less likely to come up. Business information is often firm or industry specific. Courts are probably less likely to encounter situations where a departing employee makes use of it in a remote market. To go back to the hypothetical employee at Coca-Cola: even if the company's secret formula finds a surprising demand in the world of automotive fuels, we doubt that its customer lists would as well.

One drawback to reaching further back in time to peg the foreseeability analysis is hindsight bias. Where foreseeability of the defendant's use is assessed in the present based on some state of affairs in the distant past, hindsight bias may push toward an anachronistic conclusion that the defendant's use was more foreseeable than it actually was.[262] We concede that, to some degree, this bias is likely unavoidable. Still, as courts develop a body of case law applying a foreseeability filter in trade secrecy, they may come to rely on various considerations to help mitigate hindsight bias' effects, much the same way as patent jurisprudence has done in assessing nonobviousness.[263]

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261. *See* 35 U.S.C. § 102(g) (1952 Act, repealed 2011) (providing, before the 2011 enactment of the America Invents Act, that priority is generally granted to the first inventor who reduces the invention to practice). Reducing an invention to practice means building a working version of it or filing a patent application with enough disclosure to enable others in the field to build a working version of it. *See* MERGES & DUFFY, *supra* note 93, at 424 (explaining that § 102(g)'s priority rules were applied to define the "date of invention" in other subsections of the 1952 Patent Act). Since the America Invents Act of 2011 shifted U.S. patent law to a first-to-file priority system, the date of invention has become less relevant to recently issued patents. *See* Timothy R. Holbrook, *Patent Disclosures and Time*, 69 VAND. L. REV. 1459, 1463 (2016).

262. *See generally* Jeffrey J. Rachlinski, *A Positive Psychological Theory of Judging in Hindsight*, 65 U. CHI. REV 571 (1998).

263. *See, e.g.*, Graham v. John Deere Co., 383 U.S. 1, 17–18 (1966) (explaining that "secondary

III. POSSIBLE IMPLEMENTATIONS

So what now? Courts have gotten trade secrecy into its current muddle on adaptive uses. Courts can just as well get it out. Across multiple intellectual property regimes, judges have been the driving force behind crafting and refining infringement standards.[264] Try and find the substantial similarity standard in the Copyright Act or the doctrine of equivalents in the Patent Act.[265] You'll find them only in judicial opinions.[266] Even provisions within these statutes that modern practitioners may take for granted as legislative, from copyright's idea/expression dichotomy[267] and fair use defense[268] to patent law's nonobviousness requirement,[269] began in the courts, only to be codified later once Congress had caught up.[270]

Likely nowhere within IP is this judicial role more profound than in trade secrecy. Unlike copyrights and patents, which received at least terse legislative protection beginning with the very first Congress, trade secrets have lived most of their existence without even a primordial statute to cling to. Trade secrecy is a creation of the com-

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considerations as commercial success, long felt but unsolved needs, failure of others . . . might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented" and "as indicia of obviousness or nonobviousness, these inquiries may have relevancy"); In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig., 676 F.3d 1063, 1079 (Fed. Cir. 2012) (emphasizing the importance of these secondary considerations in "guard[ing] as a check against hindsight bias"). For further exploration of the hindsight problem in patent law's nonobviousness context, see Gregory N. Mandel, *Patently Non-Obvious: Empirical Demonstration that the Hindsight Bias Renders Patent Decisions Irrational*, 67 Ohio St. L. J. 1391 (2006); Glynn Lunney, Jr. & Christian T. Johnson, *Not So Obvious After All: Patent Law's Nonobviousness Requirement:* KSR*, and the Fear of Hindsight Bias*, 47 Ga. L. Rev. 41 (2012).

264. Peter S. Menell, *The Mixed Heritage of Federal Intellectual Property Law and Ramifications for Statutory Interpretation*, *in* Intellectual Property and the Common Law 63, 63 (Shyamkrishna Balganesh ed., 2013) (discussing the standards for patent and copyright infringement and concluding that "the judiciary's imprint and evolving role are unmistakable and profound").

265. Go on. We'll wait.

266. For an excellent survey of courts' role in fashioning these two statutory torts, see generally Menell, *supra* note 264.

267. 17 U.S.C. § 102(b).

268. *Id.* § 107.

269. 35 U.S.C. § 103.

270. *See* Menell, *supra* note 264.

mon law.[271]

Today, of course, we have both state and federal trade secret statutes. Yet while they establish that misappropriation can occur through "use," they leave the term largely undefined.[272] As a matter of textual plain meaning, it's not as if that word self-evidently must include mental reliance on information in order to adapt it into something else. (If it did, designing around a patent claim would be infringing under the Patent Act,[273] a result that would be dead wrong as a matter of patent law.) Judges must supply the normative content. Indeed, they've already established infringement scope in precisely this way for the wrongful acquisition form of liability, defining what makes different forms of copying proper or improper.[274] They can do so just as easily for forms of adaptive use. The breadth with which courts have thus far defined "use" would be understandable if on balance there were good policy reasons to do so. Our argument here is that there aren't.

Nevertheless, even if a court agrees with the basic principle that adaptations should be treated differently than duplications, they would still have several options for how to operationalize it in actual doctrine. Our primary proposal has been to target the underlying definition of liability, embedding a more robust substantial-derivation test within the elements of a plaintiff's claim. Courts could conceivably take a different tack, however. They could recognize an affirmative defense for adapters or even allow liability while excluding an adaptation's downstream value from the remedies calculation. In this final Part, we examine the pros and cons of each approach.

A. Prima Facie Case

The main benefit of implementing our proposal within a plaintiff's prima facie case is to give losing claims a relatively quick off-ramp. The further into litigation a potential defendant must go before being able to argue materiality and foreseeability, the less any doctrinal intervention is likely to encourage that potential defendant to

271. *See supra* text accompanying note 38.

272. *See, e.g.*, UTSA § 1; 18 U.S.C. § 1839.

273. *See* 35 U.S.C. § 271(a) ("[W]hoever without authority . . . uses . . . any patented invention, within the United States . . . during the term of the patent therefor, infringes the patent.")

274. For example, the reverse-engineering exception, one of the most important limitations on trade secret liability, was a creation of the courts. *See, e.g.*, *Kewanee*, 416 U.S. at 476 (1974) (citing National Tube Co. v. Eastern Tube Co., 3 Ohio Cir. Ct. R. NS. 459, 462 (1902), *aff'd* 70 NE. 1127 (1903)).

continue working with another's trade secret. Structuring our proposal within the elements of the tort would allow many claims to be dismissed on summary judgment. What's more, given the open-endedness of the term "use" in the definition of misappropriation, it's a textually straightforward move to make. On the other side of the ledger, however, is error costs. Liability is a binary; one either committed misappropriation or not. If the decision-maker gets the answer wrong (that is, fails to rule in favor of the party whose victory would best promote social welfare), there's no way to modulate the severity of the error. It's all or nothing.

Those error costs are particularly salient because getting the answer right on a claim of misappropriation through use will often require a court to get another answer right on an accompanying claim of misappropriation through acquisition or disclosure. And that answer isn't always going to be straightforward.

To reach the right outcome, courts would need to follow two principles. The first is that adaptation shouldn't absolve a defendant of liability for other harmful acts. Unauthorized disclosures or acquisitions are generally counterproductive whether or not they accompany adaptation that happens to be productive. Even groundbreaking adapters should thus still be accountable if after the fact they disclose the secret in ways likely to destroy its value or if before the fact they use improper means to acquire it. As to disclosure, a fundamental premise of our argument is that they threaten little legitimate market harm to the trade secret owner.[275] But if the use winds up spilling the secret, it wipes out the entire value. Even if controlling unanticipated derivatives does not enter a firm's ex ante investment calculus, controlling against exclusivity-destroying disclosures surely does. Courts should therefore hold downstream adapters liable for any public disclosures—just as they do already—independently of any defenses those adapters may have against a use-based claim of misappropriation.[276]

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275. *See supra* section II.C.

276. Admittedly, this nondisclosure caveat reduces the value of our proposal to potential defendants. Any new incentive to adapt existing secrets could be offset by the risk of liability through the backdoor of disclosure. But we doubt that this risk would change the investment decision very often. Adapters that plan to commercialize their discoveries have an interest in maintaining secrecy, just as the upstream trade secret owner does. To the extent that their interests are aligned, a continued-secrecy requirement shouldn't significantly alter adapters' commercialization strategies. Indeed, this assumption that appropriator and originator alike wouldn't want to see a secret get out is why trade secrecy tolerates reverse engineering. *See, e.g.*, Faiveley Transp. Malmo AB v. Wabtec Corp., 559 F.3d 110, 119 (2d Cir. 2009) ("[Appropriators] will often have the same incentive as the originator to maintain the confidentiality of the secret in order to profit from the proprietary knowledge."); Pamela Samuelson &

And as to wrongful acquisition, the requirement serves an independently productive purpose of channeling downstream actors toward commercial methods with large positive externalities.[277] The definition of misappropriation privileges reverse engineering over industrial espionage because, as the Seventh Circuit has noted, it "involves the use of technical skills that we want to encourage."[278] Reverse engineers learn by doing, and that learning can eventually spill over into future innovations. By distinguishing between proper and improper means of acquisition, trade secrecy effectively subsidizes that learning. A competitor who might otherwise be indifferent between costly reverse engineering and equally costly snooping is pushed toward the more socially productive option.[279] Courts should therefore continue to discriminate between legitimate and illegitimate acquisition, irrespective of whether the acquisition yields a slavish imitation or a radically different result.

The second principle is an important exception to the first: adapters should be entitled to wider leeway to make a limited disclosure to their coworkers, and their coworkers should similarly have wider leeway to acquire the information from them. This exception is necessary because adapters are often working as part of a team. If a

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Suzanne Scotchmer, *The Law and Economics of Reverse Engineering*, 111 YALE L.J. 1575, 1658 (2002) (noting that trade secret cases seldom need to address a reverse engineer's attempt to publish the secret "because reverse engineers have generally had little incentive to publish or otherwise disclose information they learn from reverse engineering. Reverse engineers have typically kept the resulting know-how secret for competitive advantage.").

277. The notion that an otherwise-lawful use of information could be tainted by the manner in which it was initially obtained is already a familiar principle of copyright's fair use doctrine. *See* Harper & Row Publ'ns v. Nation Enters., 471 U.S. 539, 563 (1985) (rejecting a fair use defense where the defendant had "knowingly exploited a purloined manuscript"); Atari Games Corp. v. Nintendo of Am. Inc., 975 F. 2d 832, 843 (Fed. Cir. 1992) (concluding that "[t]o invoke the fair use exception, an individual must possess an authorized copy of a literary work," and therefore rejecting a fair use defense to intermediate copying of source code where the defendant was not authorized to possess the code being copied).

278. Rockwell Graphic Sys. v. DEV Indus., 925 F.2d 174, 178 (7th Cir. 1991).

279. *See* Jeanne C. Fromer, *A Legal Tangle of Secrets and Disclosures in Trade: Tabor v. Hoffman and Beyond*, *in* INTELLECTUAL PROPERTY AT THE EDGE: THE CONTESTED CONTOURS OF IP 286 (Rochelle C. Dreyfuss & Jane C. Ginsburg eds., 2014) ("[R]equiring third parties to reverse engineer—rather than use the secret directly—might also be helpful to the third parties (and society at large) by teaching them more about the information, its uses, and further refinements."); Dan L. Burk, *Muddy Rules for Cyberspace*, 21 CARDOZO L. REV. 121, 174 (1999) ("[W]hen competitors do opt for independent development or reverse engineering, these alternatives channel their investment into socially useful activity—either option develops productive technological or business expertise within the firm, rather than wasteful expertise in industrial espionage.").

former employee builds on her legitimately-acquired knowledge of a trade secret to develop a product that's immaterially similar or commercially unforeseeable, our theory would at least require a finding of no misappropriation through use. But what if that same employee is pursuing that development within a new firm—is the employee liable for *disclosing* it to others within the firm, even under conditions of strict secrecy? And are those others liable for *acquiring* the trade secret without the owner's authorization?

We think not. Normally the black-letter answer could be yes. An employee can be liable for privately disclosing another's secret within the firm, and the firm could likewise be liable for the acquisition.[280] Yet to enforce that rule against adaptations that don't qualify as actionable uses would turn the entire substantial derivation framework into a nullity.[281] As a result, courts would need to show special solicitude

280. *See* Blue Star Land Servs., LLC v. Coleman, No. CIV-17-931-R, 2017 WL 6210901, at *6–*7 (W.D. Okla. Dec. 8, 2017) (concluding that under the DTSA, departing employees who formed a competing firm could be held liable on an acquisition-based theory); RESTATEMENT (THIRD), *supra* note 5, § 40 cmt. b ("[A]n actor may be subject to liability . . . . in connection with either a public or a private disclosure of a trade secret" because "[a] private disclosure can increase the likelihood of both unauthorized use and further disclosure"). In many cases, a plaintiff will allege misappropriation based on both unauthorized disclosure and use. *See, e.g.*, Penalty Kick, Mgmt. Ltd. v. Coca Cola, 318 F.3d 1284, 1292–94 (11th Cir. 2003). Cases where a plaintiff alleges only disclosure, but not use, tend to involve a defendant who publicly disclosed or threatens to publicly disclose the trade secret. *See, e.g.*, Precision Plating & Metal Finishing Inc. v. Martin-Marietta Corp., 435 F.2d 1262 (5th Cir. 1970) (awarding damages where "defendants public disclosure of the [secret] process . . . amount[ed] to a complete destruction of the value of the process").

281. In a similar vein, firms regularly include provisions in employment agreements to restrain departing employees' use of information, even when the use is immaterial or unforeseeable. Courts should view such expansive contract provisions skeptically. Contract nonenforcement doctrines like the public-policy exception could play a role, just as they have in cases over unreasonably broad noncompete agreements. *See, e.g.*, Golden Rd. Motor Inn. v. Islam, 376 P.3d 151, 155–60 (Sup. Ct. Nev. 2016); Allied Fire Protection, Inc. v. Thai, 2017 WL 4354802, *6–8 (D. Md. 2017). Some cases have also held unenforceable employment contract provisions that prohibit departing employees from using publicly available information in their new endeavors. *See* Dynamics Research Corp. v. Analytic Scis. Corp., 400 N.E.2d 1274, 1288 (Mass. App. Ct. 1980) ("[A] non-disclosure agreement which seeks to restrict the employee's right to use an alleged trade secret which is not such in fact or in law is unenforceable as against public policy."); *See also* Deepa Varadarajan, *The Trade Secret–Contract Interface*, 103 IOWA L. REV. 1543, 1587–90 (2018) (arguing that courts should limit enforcement of certain trade secret-related contract provisions in light of public policy concerns). To what extent IP owners should be able to use contract law to avoid doctrinal default rules is a topic beyond the scope of this article but dealt with extensively elsewhere. *See, e.g.*, J. H. Reichman & Jonathan A. Franklin, *Privately Legislated Intellectual Property Rights: Reconciling Freedom of Contact with Public Good Uses of Information*, 147 U. PA. L. REV. 875 (1999); Mark A. Lemley, *Beyond Preemption: The Law and Policy of Intellectual*

for private communications within the adapting firm that enable the adaptation to occur. An intrafirm-disclosure claim against the adapter, or an improper-acquisition claim against the adapter's firm, should generally rise or fall with the use claim underlying the adaptation itself.

B. Remedies

That's a delicate dance to ask courts to perform. One might therefore prefer to leave the definition of "use" alone for liability purposes and instead turn to remedies as a policy lever. Allowing courts to lower the penalty would reduce the social cost of imposing liability on a defendant who is engaged in productive activity. A judge could, for example, hold a defendant liable for any use of a trade secret but refuse to award damages unless the plaintiff could prove foreseeable harms caused by the defendant's use.

As a practical matter, working materiality and foreseeability considerations into trade secret remedies would be a mixed bag. When only damages are at issue, there shouldn't be much difficulty. Trade secret damages, including both compensatory awards and disgorgement of a defendant's profits, already take proximate causation into account.[282] The doctrinal infrastructure is already set up.

It may be harder, however, to incorporate those same factors into the analysis of injunctive relief. An injunction is what misappropriation plaintiffs most commonly want,[283] and courts are likely to grant one, even if they're also awarding damages.[284] Notwithstanding the Supreme Court's decision in *eBay v. MercExchange*,[285] which reduced the availability of injunctions as a matter of course in patent disputes,[286] a

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Property Licensing, 87 Calif. L. Rev. 111, 1180–33 (1999); Maureen A. O'Rourke, *Drawing the Boundary Between Copyright and Contract: Copyright Preemption of Software License Terms*, 45 Duke L.J. 479 (1999); Jonathan M. Barnett, *Why is Everyone Afraid of IP Licensing?*, 30 Harv. J.L. & Tech. 123, 124–25 (2017).

282. See Graves, *supra* note 143, at 413–14.

283. Milgrim, *supra* note 29, §15.02[1][a].

284. *See* Elizabeth Rowe, *Unpacking Trade Secret Damages*, 55 Hous. L. Rev. 155, 161 (2017) (observing empirical results showing that "a trade secret owner who prevails on damages is likely to also receive a permanent injunction").

285. 547 U.S 388 (2006).

286. *See, e.g.*, Christopher B. Seaman, *Permanent Injunctions in Patent Litigation After eBay: An Empirical Study*, 101 Iowa L. Rev. 1949, 1949 (2016) (sshowing that after *eBay* permanent injunctions were

number of courts continue to presume that trade secret misappropriation produces irreparable harm and that successful plaintiffs are therefore entitled to an injunction.[287] Some courts at least limit the duration of an injunction to the approximate length of time that independent development of the secret would have taken.[288] Such head-start injunctions limit liability's downside for cumulative innovation. One might need to wait to continue working on a particular line of research—and, to be clear, perhaps wait far longer than is socially optimal—but at least one needn't abandon that research path altogether. Yet other courts treat perpetual injunctions as the default.[289] In those cases, where liability means leaving the secret information alone indefinitely, abandonment is a real possibility.

If courts are going to maintain the existing broad definition of use, they would need to swear off any such remedial presumptions (at least in cases involving inexact similarity). Otherwise, courts are going to reach outcomes like the one in *Monovis, Inc. v. Aquino*,[290] where a departing employee tried to design around his former employer's screw-manufacturing method and ended up permanently enjoined not only from using the secret but also from ever "competing in the single-screw compressor marketplace."[291] That employee genuinely had no choice but to find new problems to work on.

Finally, even if perpetual injunctions are taken off the table, implementing a derivation framework *exclusively* through remedies would still suffer from the delay problem mentioned in the previous section: a defendant could not get rid of a case early. Viewing the extra litigation costs and the risk-adjusted expected value of any sanctions ex ante, some would-be defendants would probably avoid activity that would have provided a net benefit to society. To be sure, lowering the odds of a high dam-

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granted 72.5% of the time, while before *eBay* they were granted in almost all cases).

287. *See, e.g.*, E.I. Dupont de Nemours & Co. v. Kolon Indus. Inc., 894 F.Supp.2d 691 (E.D.Va. 2012).

288. *See* Milgrim, *supra* note 29, §15.02.

289. *See, e.g.*, Halliburton Energy Services, Inc. v. Axis Technologies, LLC, 444 S.W.3d 251 (Tex. App. 2014) (discerning "no trend . . . in favor of more limited 'lead time' injunctions" and suggesting that "the 'usual equitable order' in a trade secret misappropriation case is a perpetual injunction against the wrongdoer"); *see also* Microstrategy, Inc. v. Business Objects, S.A., 661 F. Supp. 2d 548, 550 (E.D. Va. 2009) (demonstrating a defendant's burden when seeking to dissolve a perpetual injunction in a trade secret case).

290. 905 F. Supp. 1205 (W.D.N.Y. 1994)

291. *Id.* at 1235–36.

ages award would dampen potential plaintiffs' interest in suing to begin with. But relying on that effect puts great pressure on courts to get the damages calculation right consistently.[292] Erroneously high damages awards are bound to happen some of the time, and plaintiffs can always at least threaten to sue. However many potential defendants would be unwilling to test their luck when liability is uncertain, the number is probably much higher when liability is essentially guaranteed and the only uncertainty is the size of the sanctions they'd be compelled to pay at the conclusion of litigation.

C. Affirmative Defense

A third option would, like the first, maintain the substantial derivation analysis as part of the liability stage, but structure it as an affirmative defense rather than part of the plaintiff's case. Under that approach, a defendant might defeat an otherwise-valid misappropriation claim by proving that he only used the secret to develop a different product for exploitation in a remote and unforeseeable market.

Styling substantial derivation as a defense rather than part of the underlying cause of action would most resemble the path that other IP regimes take to insulate defendants' adaptive uses. Copyright law, as discussed above in section II.A, handles intermediate copying of software through its fair-use defense (although it excludes intermediate copying of artistic works in the prima facie infringement standard, before fair use ever enters the picture). And patent law, at least in theory though not so much in practice anymore, provides an experimental-use defense to users merely trying to understand how an invention works underneath the hood.[293]

IP family resemblances aside, however, we think that placing the burden on the

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292. *Cf.* Oren Bracha & Patrick R. Goold, *Copyright Accidents*, 96 B.U. L. Rev. 1025, 1059 (2016) ("Under strict liability a user's preventive behavior is highly sensitive to consistently erroneous damage calculations by courts or to erroneous predictions about such calculations.").

293. Under modern doctrine, experimenting with a patented invention counts as an infringing use—even if done while attempting to improve the invention or design around it—so long as the user was commercially motivated. *See* Embrex, Inc. v. Serv. Eng'g Corp., 216 F.3d 1343, 1349 (Fed. Cir. 2000); Soitec, S.A. v. Silicon Genesis Corp., 81 F. App'x 734, 737 (Fed. Cir. 2003); *see also* Madey v. Duke Univ., 307 F.3d 1351, 1362 (Fed. Cir. 2002) (calling the experimental use defense "very narrow and limited to actions performed for amusement, to satisfy idle curiosity, or for strictly philosophical inquiry," while excluding any uses "in keeping with the legitimate business of the alleged infringer"). On the decline of the experimental-use defense, see generally Strandburg, *supra* note 24.

defendant makes less sense here. For the factual inquiries that we've proposed, the plaintiff is the least-cost producer of the relevant evidence.[294] The defendant's purpose or motivation doesn't matter. Only outcomes do. It's the trade secret owner, not the accused misappropriator, who is most likely to know what information was material to the original project and whether it or its industry peers foresaw the defendant's commercial use. As a result, treating these questions as part of the "use" element, rather than a freestanding defense, should lead to more efficient adjudication. Given that packaging these reforms as a defense would present the same all-or-nothing problem as embedding them within the elements of the claim, we see little upside.

CONCLUSION

Every IP regime needs a plan for how to handle inexact similarity. Trade secrecy has made it a long time without much of one—probably longer than it reasonably should have. But it can't paper over that gap any longer, if indeed it ever could. A national innovation policy increasingly dependent on trade secret law cannot afford to treat all derivative uses the same. Too many lawsuits, industrial strategies, and individual employee decisions depend on courts enabling fact finders to distinguish the good from the bad.

Fortunately, judges are in a good position to do something about it. The "substantial derivation" concept presupposes that some derivations are actually insubstantial. Fact finders just need to be able to identify them. In order to do that, they should start by focusing on the product (whether a good or a method) that the defendant is actually exploiting. Any derivation should be deemed insubstantial if there is no feature of that product that materially contributed to the protectability of the trade secret in the first place. And even when such a feature is present, the defendant's use should still be excused if it is occurring solely in an unforeseeable market.

Our proposal would change the way courts think about nonliteral similarity in trade secrecy cases. But it would do so using only the doctrinal tools courts already

294. *Cf.* Cambridge Univ. Press v. Patton, 769 F.3d 1232, 1279 & n.34 (11th Cir. 2014) (placing the burden on the plaintiffs to prove market harm in a fair use case because "where one party has all the evidence on a particular issue . . . it is equitable to require that party of go forward with the evidence."); Lydia Loren, *Fair Use: An Affirmative Defense?*, 90 WASH. L. REV. 685, 704 (2015) (criticizing other decisions that treat copyright's fair use doctrine as an affirmative defense, given that "the plaintiff typically is in a better position to provide evidence of the presence of harm to relevant markets if such harm exists").

have. Those tools can build a business environment in which not all R&D inspirations are uses. Not all derivations are substantial. And not all similarities are wrong.