

# Texas Law Review

## *See Also*

Volume 92

### Response

## Commercializing Information with Intellectual Property

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### I. Introduction

In his article *Exchanging Information Without Intellectual Property*,<sup>1</sup> Professor Burstein makes an important contribution to the literature by debunking a long-standing assumption underlying Nobel laureate Kenneth Arrow's famous disclosure paradox.<sup>2</sup> Specifically, Burstein convincingly argues that Arrow's and later scholars' assumption that innovation-related information is fully nonexcludable and homogeneous is often wrong.<sup>3</sup> With this refutation in place, Arrow's claim that an innovator would not disclose information to a third party absent some form of legal protection for fear of appropriation has significantly less bite. In turn, Burstein contends—again, convincingly—that the loud chant for broad and strong intellectual property rights based on markets-for-technology concerns about information appropriation in the context of licensing and related negotiations is not as resoundingly clear as its proponents claim.<sup>4</sup>

Yet, Burstein takes an additional step in his chain of argument that his critique does not justify. Specifically, he asserts that—at least for those

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1. Michael J. Burstein, *Exchanging Information Without Intellectual Property*, 91 TEXAS L. REV. 227 (2012).

2. See Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, reprinted in THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS 609, 614–16 (1962).

3. Burstein, *supra* note 1, at 247–70.

4. See *id.* at 274–80.

situations in which the disclosing party can exchange information without fear that the receiving party may appropriate its “core” invention—his richer account of information exchange refutes commercialization theorists’ more general claim that broad and strong rights are necessary to promote the commercialization and distribution of inventions.<sup>5</sup> Contrary to Burstein’s reasoning, development and commercialization need not always be “linked with sources of capital and skills.”<sup>6</sup> Rather, substantial commercialization occurs in-house, and as Burstein recognizes—but abstracts away from<sup>7</sup>—this “exchangeless” post-invention commercialization activity is subject to the same sorts of free riding that justify IP rights to protect pre-invention activity.<sup>8</sup> Indeed, even when access to external capital and skills is necessary, third-party investors and commercializers often demand strong intellectual property to protect *themselves*—not the inventors—against potential appropriation during the commercialization process.<sup>9</sup> So while Burstein weakens the case for strong IP rights as necessary for facilitating markets for technology via licensing and direct information exchange, this original line of his critique has little to no bearing on these broader—and, arguably, more important—appropriation concerns in the commercialization context.

Granted, Burstein makes the further argument that commercialization models fail to adequately address potential anticommons problems, as well as account for protection against appropriation available from other forms of intellectual property.<sup>10</sup> Although these arguments are sound, they assume a commercialization model grounded in the writings of Scott Kieff<sup>11</sup> and Ed Kitch<sup>12</sup> and overlook the more refined models of Michael Abramowicz,<sup>13</sup> Chris Cotropia,<sup>14</sup> John Duffy,<sup>15</sup> and mine,<sup>16</sup> which reconfigure

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5. *See id.* at 256–62 (discussing the “core” and periphery of innovation-related information); *id.* at 274–80 (rejecting commercialization theory).

6. *Id.* at 282.

7. *See id.* at 246–47.

8. *See infra* Part III.

9. *See id.*

10. *See* Burstein, *supra* note 1, at 258–74, 277.

11. *See* F. Scott Kieff & Troy A. Paredes, *An Approach to Intellectual Property, Bankruptcy, and Corporate Control*, 82 WASH. U. L.Q. 1313, 1319 (2004); F. Scott Kieff, *The Case for Registering Patents and the Law and Economics of Present Patent-Obtaining Rules*, 45 B.C. L. REV. 55, 67–69 (2003); F. Scott Kieff, *Coordination, Property, and Intellectual Property: An Unconventional Approach to Anticompetitive Effects and Downstream Access*, 56 EMORY L.J. 327, 328 (2006); F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINN. L. REV. 697, 707–08 (2001).

12. *See* Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265, 271, 287 (1977).

13. *See* Michael Abramowicz, *The Danger of Underdeveloped Patent Prospects*, 92 CORNELL L. REV. 1065, 1066 (2007).

14. *See* Christopher A. Cotropia, *The Folly of Early Filing in Patent Law*, 61 HASTINGS L.J. 65, 69–71 (2009).

commercialization theory to take account of these concerns. As such, Burstein attacks only a narrow strain of the full gamut of commercialization approaches. When these broader approaches are considered, Burstein's criticisms lose much of their force.

I develop my Reply as follows. Part II offers a generally supportive review of Burstein's rich description of information exchange in the innovation context. Indeed, I buttress Burstein's claims with additional empirical evidence on licensing practices among biotechnology and pharmaceutical companies. Part III provides a less sanguine view of Burstein's contention that his line of argument casts considerable doubt on commercialization theory. Although I agree that Burstein weakens the case for strong IP rights on the basis of markets-for-technology concerns, he does little to dispel more expansive commercialization models. The Response concludes by echoing Professor Burstein's call for further empirical research to resolve longstanding uncertainties regarding the appropriate level and type of IP protection to promote innovative activity.

## II. The Varieties of Informational Experience

To draw from the title of William James's well-known work, *The Varieties of Religious Experience*,<sup>17</sup> Burstein makes a strong case that technological information is a multi-faceted beast.<sup>18</sup> Unlike Arrow's conception of information as a "unitary good" that either stays secret or is fully revealed—which Burstein appropriately analogizes to a stock tip—Burstein draws on a rich literature to show that the multi-layered properties of information imply that innovators can disclose some important information without always revealing the "secret sauce" of the innovation per se.<sup>19</sup> As Burstein properly recognizes, this finding has two important implications.

First, it means that innovation-related information is not always nonexcludable, at least in the sense that revealing enough information to provide a potential business partner, licensee, or customer with some sense of the value of the innovation does not necessarily reveal how to make or use the innovation itself.<sup>20</sup> Indeed, as Burstein—as well as Peter Lee in a recent article<sup>21</sup>—insightfully explains, the "tacit" nature of information often means

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15. See Michael Abramowicz & John F. Duffy, *Intellectual Property for Market Experimentation*, 83 N.Y.U. L. REV. 337, 340–45 (2008).

16. See Ted Sichelman, *Commercializing Patents*, 62 STAN. L. REV. 341, 343–47 (2010).

17. WILLIAM JAMES, *THE VARIETIES OF RELIGIOUS EXPERIENCE: A STUDY IN HUMAN NATURE* (1902).

18. Burstein, *supra* note 1, at 247–70.

19. *Id.*

20. See *id.* at 248–55.

21. Peter Lee, *Transcending the Tacit Dimension: Patents, Relationships, and Organizational Integration in Technology Transfer*, 100 CALIF. L. REV. 1503 (2012).

that disclosing invention-related information in commercial settings can be so costly and time-consuming that a problem the very opposite of appropriability arises.<sup>22</sup> Namely, sufficiently explaining the innovation to others can be so exceedingly difficult that there is little value in the invention without the ongoing assistance of the inventor in the further development and commercialization of the invention.<sup>23</sup>

This “partial excludability” of information has profound consequences not only for the underlying assumptions of Arrow’s paradox, but for those underlying the standard justification of intellectual rights more generally. Specifically, the traditional view of intellectual property typically assumes that the information generated by inventions and other forms of IP-protected goods is easy to appropriate.<sup>24</sup> Partial excludability indicates otherwise. As Burstein recognizes, the question is an empirical one, and there is a line of literature—showing that the costs of replicating inventions is fairly substantial—that supports his thesis. For instance, in a widely cited study, company managers reported that imitation costs averaged about sixty-five percent of innovation costs.<sup>25</sup> This large fraction indicates that technological information tends to be costly to digest in order to create imitative products and processes.

Second, the nonhomogeneous (i.e., multilayered) nature of information means that innovators can often control the level of information they release to third parties and the public.<sup>26</sup> As Burstein explains, in the context of venture capital financing or joint research negotiations, the innovator can selectively disclose key pieces of information at early stages, only progressing to the core information once certain negotiation hurdles have been passed.<sup>27</sup> Certain of these hurdles may include, for instance, due

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22. Burstein, *supra* note 1, at 261–63.

23. *See* Lee, *supra* note 21. *See also* Richard Jensen & Marie Thursby, *Proofs and Prototypes for Sale: The Licensing of University Inventions*, 91 AM. ECON. REV. 240, 241 (2001) (noting that university inventions are usually “so embryonic that additional effort in development by the inventor is required for a reasonable chance of commercial success”).

24. *See* Stuart J.H. Graham & Ted Sichelman, *Why Do Start-Ups Patent?*, 23 BERKELEY TECH. L.J. 1063, 1064–65 (2008) (noting that the primary driver of patent protection is that the “copying and selling of innovative products by competitors can often be achieved cheaply and easily, which can suboptimally stymie innovation”); Kal Raustiala & Christopher Sprigman, *The Piracy Paradox: Innovation and Intellectual Property in Fashion Design*, 92 VA. L. REV. 1687, 1688 (2006) (“The standard justification for intellectual property rights is utilitarian. Advocates for strong intellectual property (‘IP’) protections note that scientific and technological innovations, as well as music, books, and other literary and artistic works, are often difficult to create but easy to copy. Absent IP rights, they argue, copyists will free-ride on the efforts of creators, discouraging future investments in new inventions and creations. In short, copying stifles innovation.”).

25. Edwin Mansfield et al., *Imitation Costs and Patents: An Empirical Study*, 91 ECON. J. 907, 909 (1981).

26. *See* Burstein, *supra* note 1, at 254–58.

27. *See id.* at 254 (“Most simply, parties can engage in selective disclosure. If parties are able to partition their information so as to reveal some but not all of the relevant information to

diligence by the innovator into the reputation of the third party for appropriating and using information.<sup>28</sup>

Burstein makes a strong case that the effect of this multistage disclosure—coupled with other effective protections, such as reputational effects and norms—allows Arrow’s Paradox often to be overcome without the use of strong intellectual property protection.<sup>29</sup> As his paradigmatic example, Burstein describes negotiations between innovator biotech companies and potential licensee–commercializer branded pharmaceutical companies, basing his descriptions on conversations with entrepreneurs and inventors as well as inferences drawn from several leading empirical studies.<sup>30</sup>

Indeed, Burstein’s account is supported by even more specific empirical evidence. In a recent study, investigators found that the availability of strong patent protection had no statistically significant effect on the willingness of startup firms in five industries, including biotechnology, to enter into financing relationships with other companies (i.e., corporate venture capital)—circumstances that present substantial appropriation concerns.<sup>31</sup> However, in the same study, trade secrecy was a statistically significant factor favoring such relationships.<sup>32</sup> Although trade secrecy is in some sense a form of intellectual property,<sup>33</sup> it is not the type of IP right that traditionally has been considered to greatly facilitate licensing and markets for technology.<sup>34</sup> Likewise, in Burstein’s model, trade secrecy goes hand-in-hand with the multilayered nature of information he describes—to the extent that the biotech innovator can retain “core” information as a secret, it need

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counterparties, then it is possible to facilitate exchange while simultaneously guarding against misappropriation.”).

28. *See id.* at 266; *see also* Luis Diestre & Nandini Rajagopalan, *Are All “Sharks” Dangerous? New Biotechnology Ventures and Partner Selection in R&D Alliances*, 33 STRATEGIC MGMT. J. 1115, 1124 (2012) (hypothesizing that biotech startups investigate potential pharmaceutical company partners’ reputation for appropriating innovative knowledge).

29. *See* Burstein, *supra* note 1, at 274–75.

30. *See id.* at 268–71, 280–82.

31. *See* Riitta Katila et al., *Swimming with Sharks: Technology Ventures, Defense Mechanisms and Corporate Relationships*, 53 ADMIN. SCI. Q. 295, 316 (2008).

32. *See id.*

33. *See* Mark A. Lemley, *The Surprising Virtues of Treating Trade Secrets as IP Rights*, 61 STAN. L. REV. 311, 331 (2008).

34. *See* Ashish Arora, *Licensing Tacit Knowledge: Intellectual Property Rights and the Market for Know-How*, 4 ECON. INNOVATION & NEW TECH. 41 (1995) (emphasizing the importance of patent protection in the process of contracting for the transfer of tacit knowledge); Lee, *supra* note 21, at 1544 (“[P]atents represent the ‘leading wedge’ that initiates greater linkages (and technical communication) between licensor and licensee.”).

not fear appropriation when disclosing secondary information as part of the deal process.<sup>35</sup>

Taking the partial excludability and nonhomogeneity of information in tandem, the greatest strength of Burstein's article is in casting doubt on the markets-for-technology view of IP of Ashish Arora, Andrea Fosfuri, Alfonso Gambardella,<sup>36</sup> Robert Merges,<sup>37</sup> and others<sup>38</sup> that IP rights play a critical role in allowing companies to transact over innovation-related information.<sup>39</sup> To the contrary, Burstein convincingly argues that these sorts of transactions can and do take place in the absence of traditional IP rights in important fields such as biotech and software, and provides a strong theoretical basis that the same holds in other technological spaces.<sup>40</sup> Of course, as he notes, the extent that such exchange without IP occurs is an empirical question that needs to be explored further, but Burstein has laid important groundwork for that endeavor.<sup>41</sup>

### III. Commercialization "Writ Large"

Professor Burstein draws on earlier work of mine to explain that "[i]n one view, the steps comprising 'innovation' include identifying a problem to be solved, developing a working prototype, market testing and marketing, distribution, and follow-on improvements."<sup>42</sup> This broad notion of innovation underlies the efforts of Michael Abramowicz, John Duffy, and mine to expand the commercialization theory beyond the domain of coordinating activity among initial inventors, subsequent inventors, and commercializers, to more fully account for potentially pernicious free-riding during the post-invention commercialization process.<sup>43</sup> Indeed, Burstein

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35. See Burstein, *supra* note 1, at 255–58 (“[Secondary] information enables potential funders and partners to evaluate the business opportunity without appropriating the core information asset.”).

36. See ASHISH ARORA, ANDREA FOSFURI & ALFONSO GAMBARDELLA, *MARKETS FOR TECHNOLOGY: THE ECONOMICS OF INNOVATION AND CORPORATE STRATEGY* (2001).

37. See Ashish Arora & Robert P. Merges, *Specialized Supply Firms, Property Rights and Firm Boundaries*, 13 *INDUS. & CORP. CHANGE* 451 (2004); Robert P. Merges, *A Transactional View of Property Rights*, 20 *BERKELEY TECH. L.J.* 1477 (2005).

38. See Paul J. Heald, *A Transaction Costs Theory of Patent Law*, 66 *OHIO ST. L.J.* 473 (2005), Robert D. Cooter & Aaron Edlin, *Law and Growth Economics: A Framework for Research* (Jan. 13, 2011) (unpublished manuscript), available at <http://escholarship.org/uc/item/50t4d0kt>.

39. See Burstein, *supra* note 1, at 247–70.

40. See *id.* Peter Lee makes a related observation that IP rights may be insufficient to transfer tacit knowledge in the context of university innovation, which encompasses a variety of technological fields. See Lee, *supra* note 21, at 1568 (“[T]he enduring importance of tacit knowledge challenges the sufficiency of patent licensing alone to promote technology transactions.”).

41. See Burstein, *supra* note 1, at 280–82.

42. See *id.* at 238 (citing Sichelman, *supra* note 16, at 348–54).

43. See Abramowicz & Duffy, *supra* note 15, at 340 (noting that late-entering competitors “can copy the first experimenter’s market successes and avoid repeating its failures”); Sichelman, *supra*

recognizes as much when he states that “these commercialization theorists have successfully focused attention on a more nuanced model of the innovation process than that which underlies the classical incentive or reward theory.”<sup>44</sup>

Yet, when Burstein attempts to discredit commercialization later in his article, he ignores this free-riding strand of commercialization theory, instead solely grounding it on the coordination strand:

These conclusions cast doubt upon a core argument in favor of expanding intellectual property. Recall from Part I that *the unique economic function that underlies commercialization theory is the linking of ideas and capital or skills*. Commercialization theory justifies intellectual property on the ground that it facilitates the development and commercialization of early-stage inventions. *It does so, in this telling, by solving the disclosure paradox*. But if intellectual property does not solve the disclosure paradox in all cases—if, indeed, neither the disclosure paradox nor the intellectual property solution operates as the commercialization theorists predict—then commercialization cannot be a stand-alone justification for intellectual property.<sup>45</sup>

Only by improperly grounding commercialization theory solely on the basis of “solving the disclosure paradox” to promote the “linking of ideas and capital or skills,” is Burstein able to claim that “commercialization cannot be a stand-alone justification for intellectual property.”<sup>46</sup> If Burstein had considered the broader notion of commercialization theory that he described earlier in his article—namely that commercialization theory also justifies intellectual property on the ground that it protects against post-invention appropriation during the commercialization process—he would not be able draw these broad conclusions. Perhaps Burstein justifies his approach by lumping the free-riding strand of commercialization theory along with the traditional incentive theories, thereby associating what he terms “commercialization theory” solely with the markets-for-technology justification for IP.<sup>47</sup> Although there is some coherence to such a move, it certainly departs from the traditional usage of “commercialization theory” in the literature,<sup>48</sup> and Burstein’s putative dismissal of commercialization theory

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note 16, at 352 (“If a commercializer truly performs innovative and non-obvious market testing and marketing that cannot be protected by trade secret or patent law, then third parties can free ride on those efforts, providing an *ex ante* disincentive for the testing and marketing, which can in turn result in an *ex ante* disincentive to invent.”).

44. Burstein, *supra* note 1, at 241; *see also id.* at 239 (describing Kitch’s prospect theory and stating that “[i]f commercialization is just as expensive and subject to free riding as the initial act of invention, then a broad patent will serve to internalize those costs in the patent holder”).

45. *Id.* at 275 (emphasis added) (footnote omitted).

46. *Id.*

47. *See id.* at 241 (“The theory that commercialization efforts may be freely appropriable by others, and therefore need to be incentivized *ex ante* through a system of exclusive rights, is functionally indistinguishable from the theory that creative or inventive activity may be freely appropriable by others and therefore needs to be incentivized through a system of exclusive rights. In many ways, the ‘commercialization dilemma’ is a version of the same public goods problem that is thought to hamper inventive or creative activity in the first instance. It just occurs later in time.”).

48. *See, e.g.,* Jeanne C. Fromer, *Expressive Incentives in Intellectual Property*, 98 VA. L. REV. 1745, 1764 n.107 (2012) (associating commercialization theory with the work of Abramowicz &

in the latter part of his article does nothing to adopt such an alternative usage.<sup>49</sup>

The multi-faceted nature of technological information exchange arguably does little to protect commercializers against appropriability concerns in activities such as market testing and marketing, distribution,<sup>50</sup> and commercial improvements, because unlike technological information, it appears most commercial information is fairly homogeneous and nonexcludable.<sup>51</sup> To use Burstein's example of pharmaceutical development, for example, the fact that biotech startups can disclose their original molecules in a layered approach does not reduce the need for strong IP

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Duffy); Mark A. Lemley, *The Myth of the Sole Inventor*, 110 MICH. L. REV. 709, 738–745 (2012) (commenting on the works of not only Kitch and Kieff, but also Abramowicz, Duffy, Roin, and Sichelman when discussing commercialization theory).

49. See Burstein, *supra* note 1, at 274–76. Burstein mentions in a footnote that “intellectual property may, of course, be justified on other grounds” and, in turn, that he does “not question those grounds for the purpose of this Article.” *Id.* at 275 n.255. However, in so doing, he cites sources in other footnotes that support the traditional reward theory justification for intellectual property. See *id.* at 235 n.23 (citing WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW* 294–300 (2003); SUZANNE SCOTCHMER, *INNOVATION AND INCENTIVES* 38 (2004); Peter S. Menell & Suzanne Scotchmer, *Intellectual Property Law*, in 2 HANDBOOK OF LAW AND ECONOMICS 1473, 1476–78 (A. Mitchell Polinsky & Steven Shavell eds., 2007)). Although Menell and Scotchmer use the term “innovation,” they use it in a manner more akin to “invention,” rather than to signal any support for commercialization theories. See Menell & Scotchmer, *supra*, at 1476–78; see also SCOTCHMER, *supra*, at 38 (describing the rationale for intellectual property in the context of research and development rather than nontechnological commercialization activities). Indeed, Menell and Scotchmer expressly dismiss commercialization theories. See Menell & Scotchmer, *supra*, at 1486 (“Where adequate incentives exist to invent, free market forces should be adequate to promote commercialization.”). So whatever Burstein's intention, this footnote cannot be read as narrowing Burstein's usage of the term “commercialization theory.”

50. In his reply to my reply, Burstein expressly contends that “[commercialization] theory is not economically distinguishable from the more traditional incentives-based justification for intellectual property, which focuses on incentives to create.” Michael J. Burstein, *Reply—Commercialization Without Exchange*, 92 TEXAS L. REV. SEE ALSO 45, 45 (2014) [hereinafter, Burstein, *Reply*]. In his view, “[i]nnovators may find that their efforts are freely appropriable by others throughout this supply chain, and exclusive rights may be invoked to prevent misappropriation, and thereby create ex ante incentives for economic activity, at any point.” *Id.* Burstein labels such an approach an “incentive-to-commercialize” theory, in contrast to the “markets for technology” coordination prong of commercialization theory. As my reply suggests, I am quite sympathetic to Burstein's disambiguation, with the qualification that the types of information appropriable in the “invention” and “invention-improvement” stages tend to be technological in nature—that is, related to R&D—while the information in the commercialization stage tends to be market-oriented, such as pricing, marketing, and safety information. See Sichelman, *supra* note 16, at 348–54. Nonetheless, as I mentioned earlier, scholars have used commercialization theory to refer both to what Burstein categorizes as the incentive-to-commercialize *and* markets-for-technology coordination views. See *supra* note 48. In the latter part of his article, Burstein obscures these differences in his relatively broad critique of commercialization theory, though he properly cabins his analysis in his reply. See Burstein, *Reply*, *supra*, at 47–51.

51. In this sense, safety, efficacy, and pricing information are much like Burstein's paradigmatic example of homogeneous information—a stock tip. See Burstein, *supra* note 1, at 247–48. In other words, whether the drug is approved by the FDA or not, dosage and price details are public information that cannot be selectively disclosed.

protection for the commercializing pharmaceutical company. If pharmaceutical companies were without post-invention IP protection, they would have little incentive to go through lengthy and costly testing required by the FDA—which totals in the hundreds of millions of dollars (taking into account failures)<sup>52</sup>—or the extensive marketing and market testing necessary to create demand for approved products.<sup>53</sup> Unlike technological information, commercial information such as whether a product is safe and effective or what pricing the public will bear are homogenous types of information that are easily appropriable.<sup>54</sup> In other words, if we suppose an underlying molecule otherwise protected by a patent were in the public domain, nobody would have sufficient financial incentive to engage in the costly and risky FDA testing and subsequent marketing and distribution necessary to turn the molecule into a commercially viable product.<sup>55</sup> Even the strongest proponents of reward theory tend to admit that commercialization theory has substantial bite in the context of pharmaceutical innovations.<sup>56</sup>

So although biotech companies may not have a strong direct need for patent protection themselves, it is essential that they acquire such protection, because the pharmaceutical companies that ultimately manufacture and market their drugs do have quite a pressing need for such protection. When biotech investors talk about the importance of patent protection for startup biotech companies, the underlying driver is the ultimate use of the patents by the branded pharmaceutical companies to protect the commercialization process, rather than to prevent appropriation during early-stage negotiations.

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52. See PETER TOLLMAN ET AL., THE BOS. CONSULTING GRP., A REVOLUTION IN R&D: HOW GENOMICS AND GENETICS ARE TRANSFORMING THE BIOPHARMACEUTICAL INDUSTRY 12 (2001), available at [www.bcg.com/publications/files/eng\\_genomicsgenetics\\_rep\\_11\\_01.pdf](http://www.bcg.com/publications/files/eng_genomicsgenetics_rep_11_01.pdf) (estimating the cost to discover, develop, and commercialize each patented drug at about \$880 million).

53. See Benjamin N. Roin, *Unpatentable Drugs and the Standards of Patentability*, 87 TEXAS L. REV. 503, 510–11 (2009) (“For some inventions, however, patents do play an essential role in promoting development and commercialization, and drugs are a clear example. Pharmaceutical companies on average spend upwards of \$800 million on R&D for each new drug that reaches the market. Roughly half of that money is spent satisfying the FDA’s clinical-trial requirements to establish the safety and efficacy of new drugs, producing data that cannot be protected with patents.”).

54. See *id.* at 516 (“[W]henever the post-invention costs of developing and commercializing an invention are substantial and vulnerable to free riding by competitors, the novelty and nonobviousness requirements can cause patents to be denied to inventions that are unlikely to reach the public without that protection. This problem arises in the pharmaceutical industry because of the need for safety and efficacy testing, which forces pharmaceutical companies to invest hundreds of millions of dollars in clinical trials while generics can enter the market almost freely.”).

55. See *id.*; Sichelman, *supra* note 16, at 354 (“So while invention is a cumulative process, so is commercialization. Similarly, while invention produces information subject to free riding, so does commercialization. And, like invention itself, the risks of *commercializing* inventions regularly demand supernormal returns to justify taking them.”).

56. See, e.g., Lemley, *supra* note 48, at 744 (“There is one industry in which the commercialization story actually seems to work: pharmaceuticals.”).

Thus, attempts to discredit commercialization theory solely by focusing on the markets-for-technology justification ring fairly hollow.

Of course, one may attempt to discredit—or at least narrow the scope of—broader commercialization theories on other grounds, and Burstein discusses a variety of well-worn arguments along these lines, such as the availability of first-mover advantage, norms, and complementary assets.<sup>57</sup> Indeed, earlier work of mine casts doubt on the strain of commercialization theory that calls for broad, strong rights backed by injunctions, because high bargaining costs can often thwart ultimate commercialization, suggesting that liability rule protection (i.e., forward-looking money damages) may be more optimal in many situations than traditional property rules (i.e., injunctions).<sup>58</sup> Abramowicz, Cotropia, and Duffy similarly take into account several of these concerns, qualifying traditional commercialization theory's call for strong and broad rights.<sup>59</sup> As Burstein recognizes, due to a dearth of data, there are unfortunately no clear winners in these several decades-old debates.<sup>60</sup> As such, Burstein cannot rely upon such claims to refute commercialization theory.

#### IV. Conclusion

In sum, Burstein's attempt to dismiss commercialization theory as a "stand-alone justification for intellectual property" founders by casting the theory's foundation much too thinly. On the other hand, Burstein has made a convincing theoretical argument that justifying strong IP rights on an information-exchange, markets-for-technology basis is weaker than commonly believed. Precisely how much weaker is a thorny empirical question, but one well worth exploring in more detail. Importantly, the upshot of these investigations could significantly alter our understanding of the foundations of intellectual property law.

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57. See Burstein, *supra* note 1, at 258–70. See generally David J. Teece, *Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy*, 15 RES. POL'Y 285, 288–92 (1986) (explaining that "complementary assets" include firm attributes such as well-defined marketing channels, strong manufacturing capabilities, and easy access to credit).

58. See Sichelman, *supra* note 16, at 406–08; see also Ted Sichelman, *Purging Patent Law of "Private Law" Remedies*, 92 TEXAS L. REV. 517 (2014).

59. See *supra* notes 13–15.

60. See Burstein, *supra* note 1, at 275–76, 281–82.