

“LESS IS MORE”: NEW PROPERTY PARADIGM IN THE INFORMATION AGE?

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ABSTRACT

Before striking down laws increasing copyright’s domain, judges and legislators are asking for evidence that information products will be created even if copyright protection is not provided. The future of Internet technology depends on locating this evidence in time to limit expansive copyright. United States law, however, already protects information products under copyright. Hence, this counterfactual evidence that judges request cannot be generated in the United States. In response to the demand for data, American legal scholars have attempted to mine evidence from open software and other non-commercial endeavors on the Internet. However, these endeavors have been dismissed as exceptions or “cults,” unrelated to mainstream industry needs.

This Article, for the first time, provides evidence of growth in the commercial software industry without intellectual property protection. Between 1993 and 2010, the software industry in India emerged as the fastest growing in the world, accounting for \$76 billion in revenues by 2010. In the same time period, the software industry in India remained unaffected by changes in intellectual property protection for software. By demonstrating industry growth without strong intellectual property protections, the Indian data fills the critical gap in American literature.

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Moreover, the comparative data from India enables scholars to separate causality from outcomes in specific empirical and analytical studies emerging out of the United States. In the case study of California's Silicon Valley, for instance, there is a risk that causality may be extrapolated to alternative California statutes, giving rise to errors of second order. The comparative analysis checks this potential inaccuracy. The industry in India also provides illuminating data from contracting practices—decisive evidence of the legal infrastructure firms need and will create by contract, if not found in a priori law. This study equips policy-makers to go beyond the "historic accident" explanation to understand why the software industry flourishes where it does.

INTRODUCTION

The Supreme Court and Congress ask for evidence that information production would occur even without copyright protection. Absent this evidence, the Court and Congress are unwilling to impose limits on copyright law.¹ For instance, this unavailability of evidence was the determining factor in upholding the law challenged in *Eldred*, which increased the term of copyright.²

¹ *Eldred v. Ashcroft*, 537 U.S. 186 (2003) [hereinafter *Eldred*]. See LAWRENCE LESSIG, *FREE CULTURE: HOW BIG MEDIA USES TECHNOLOGY AND THE LAW TO LOCK DOWN CULTURE AND CONTROL CREATIVITY* 128 (2004) [hereinafter LESSIG, *FREE CULTURE*] (discussing *Eldred* and Justice Anthony Kennedy's request for empirical evidence of information production that would have occurred without copyright). See also *Eldred*, 537 U.S. at 243 (Breyer, J., dissenting) (drawing attention to the fact that 98 percent of work for which copyright was being extended was no longer commercially available anyway); *Kahle v. Ashcroft*, No. C-04-1127 MMC, 2004 WL 2663157 (N.D. Cal. Nov. 19, 2004), *aff'd sub nom.* *Kahle v. Gonzalez*, 487 F.3d 697 (9th Cir. 2007) (called "Eldred Version 2" by Lessig; focusing on the 98 percent of the work whose copyright was being extended even though they were no longer commercially available, as Justice Breyer had pointed out in *Eldred*). See also Lawrence Lessig, *Does Copyright Have Limits? Eldred v. Ashcroft and its Aftermath*, in *OPEN CONTENT LICENSING: CULTIVATING THE CREATIVE COMMONS* 11, 21 (Brian Fitzgerald et al. eds., Sydney Univ. Press 2007).

² See LESSIG, *FREE CULTURE*, *supra* note 1, at 124, 128. Lessig believes Justice Kennedy's question on this point determined the outcome, and was decisive in the ruling on the constitutionality of the Copyright Term Extension Act of 1998. Others believe the Supreme Court was more concerned about whether Congress had the power to extend copyright term than any other issue in *Eldred*. See *id.* at 128 (referring to Justice Sandra O'Connor's question during oral hearings). Lessig, however, argues the former issue was far more pivotal because if the Court felt it was inappropriate to intervene, it would not have granted the petition. Remarkably, the Supreme Court had granted the petition to review the

On the one hand, copyright scholars, artists, and educators challenge strengthened copyright protection as inimical to innovation and free speech. Copyright protection has expanded through increases in term and enhanced rights over digital work.³ The cumulative increases in copyright protection, when combined with new technologies, enable greater control by copyright holders and strain free speech and innovation.⁴

Judges, on the other hand, are reluctant to strike down an increase in copyright protection as unnecessary or as disfavoring progress. Judges fear that if they accept the argument that recent increases in copyright chill innovation, *ipso facto*, they will also need to consider striking down past term expansions or copyright law *in toto* as unnecessary or inimical to progress.⁵ Judges are thus concerned that their

D.C. Court of Appeals decision, even though the Court rarely reviews a decision by a circuit court when no other court has reviewed it. *Id.* at 123. For a detailed history, see *Eldred v. Reno*, 74 F. Supp. 2d 1 (D.D.C. 1999); *aff'd*, 239 F.3d 372 (D.C. Cir. 2001); *reh'g & reh'g en banc denied*, 255 F.3d 849 (D.C. Cir. 2001); *cert. granted*, 534 U.S. 1126 (2002); *order granting cert. amended*, 534 U.S. 1160 (2002).

³ See Sonny Bono Copyright Term Extension Act (CTEA), Pub. L. No. 105-298, § 102, 112 Stat. 2828, 2827 (1998) (codified at 17 U.S.C. §§ 301–304 (2006)) (extending the term of copyright). The CTEA is also known by the moniker “the Mickey Mouse Copyright Act.” The Digital Millennium Copyright Act (DMCA), Pub. L. No. 105-304, 112 Stat. 2863 (1998) (codified as amended at 17 U.S.C. §§ 1201–1205 (2006)) increased the control over digital work. For a discussion on the impact of the DMCA, see also STEVEN WEBER, *THE SUCCESS OF OPEN SOURCE* 210 (2004) [hereinafter WEBER, *OPEN SOURCE*] (arguing the protection over digitized products now “essentially tries to constrain technologies that are thought to pose a threat to the copyright regime, rather than punish conduct in violation of copyright *per se*.”); Yochai Benkler, *Free as the Air To Common Use: First Amendment Constraints on Enclosure of the Public Domain*, 74 N.Y.U. L. REV. 354, 415 (1999) [hereinafter Benkler, *First Amendment and Enclosure*] (pointing out the DMCA prevents circumvention *per se* and not just the rights protected under copyright); LESSIG, *FREE CULTURE*, *supra* note 1, at 157.

⁴ For a discussion on how expansive copyright in the Internet age will impede exercise of free speech, see Jack Balkin, *Digital Speech and Democratic Culture: A Theory of Freedom for the Information Society*, 79 N.Y.U. L. REV. 1, 51 (2004) (arguing that aspects of free speech are “foregrounded” by digital technologies). See also LESSIG, *FREE CULTURE*, *supra* note 1 (discussing an expansive copyright’s adverse impact on free speech and innovation).

⁵ LESSIG, *FREE CULTURE*, *supra* note 1, at 128 (discussing Justice Kennedy’s questions during oral arguments in *Eldred*. Justice Kennedy had argued, “I suppose implicit in the argument that the ’76 act, too, should have been declared void, and that we might leave it alone because of the disruption, is that for all these years the act has impeded progress in science and the useful arts. I just

ruling on recent expansions in copyright may potentially imperil a three-century-old law.⁶ The judges' quagmire is made even more difficult when stakeholders such as Walt Disney & Co. and media houses owning copyright portfolios provide estimates of financial losses that would occur if the proposed additional protection is denied.⁷ This loss estimate strikes a powerful chord and makes it hard for Congress to reject expansions in intellectual property (IP) on the basis of vague, potential claims (that free speech or innovation would have occurred without copyright).⁸

Marshaling clear evidence that an increase in copyright law would "impede progress" is imperative because the Supreme Court has just upheld the constitutionality of another copyright extension. In *Golan v. Holder*,⁹ the Supreme Court confronted the question of whether Congress has the power to restore copyright for foreign works that were previously in the public domain in the United States. The core issues were (1) whether the Uruguay Round Agreements Act, which brought some works whose copyright had lapsed back under copyright, violated the First Amendment, and (2) whether Congress had modified the traditional contours of copyright and violated the original constitutional mandate.¹⁰ The Supreme Court, however, answered these questions in the negative.

don't see any empirical evidence for that." Justice Sandra Day O'Connor also voiced similar concerns on how this ruling would affect old acts, which had extended copyright term in the past. *Id.*

⁶ See, e.g., Margaret McKeown, *Happy Birthday Statute of Anne: The Dance Between the Courts and Congress*, 25 BERKELEY TECH. L.J. 1145 (2010).

⁷ Such representations were made before Congress when the Digital Millennium Copyright Act for instance was being debated. See, e.g., *WIPO Copyright Treaties Implementation Act: Hearing on H.R. 2281 Before the Subcomm. on Telecomm., Trade, & Consumer Protection of the H. Comm. on Commerce*, 105th Cong. 56, 58 (1998) (testimony of Steven J. Metalitz on behalf of Motion Picture Association of America defending anticircumvention provision as necessary for robust electronic commerce); *id.* at 45 (statement of Hilary B. Rosen, President and Chief Executive Officer, Recording Industry Association of America, supporting anticircumvention). The software industry was more fractured; for details, see Benkler, *First Amendment and Enclosure*, *supra* note 3, at 421–22.

⁸ Balkin, *supra* note 4.

⁹ *Golan v. Holder*, 132 S. Ct. 873 (2012).

¹⁰ *Golan v. Holder*, 609 F.3d 1076 (10th Cir. 2010), *cert. granted*, 2011 U.S. LEXIS 1972 (U.S. Mar. 7, 2011) (No. 10-545), *argued* Oct. 5, 2011. For case history, see <http://www.supremecourt.gov/Search.aspx?FileName=/docketfiles/10-545.htm> (last visited Oct. 31, 2011).

Hence, the Court’s search for evidence of information production without IP protections (“IP without IP,” according to Professor Rochelle Dreyfuss) continues to have enormous significance.¹¹ American legal scholars have studied various creative endeavors that appear to be flourishing on the Internet even without strong IP protection. Among these creative endeavors, software development has been one of the most successful, and hence, legal scholars have zeroed in on and focused specially on software.¹² Moreover, the software industry thrives on innovation, and IP protection is presumed to be important. The software industry is also increasingly important to the economy,¹³ so the question of how to optimize incentives in the form of IP protections for this industry is especially important.¹⁴

Advocates of stronger copyright, however, dismiss as “cults” open-source and the various non-commercial instances of software development that American legal scholars have mined.¹⁵ Moreover, these advocates point out proprietary software is the norm and the vast majority of software programs are made available under existing copyright and patent laws.¹⁶ Thus, it is difficult for American legal scholars to prove that industry will create software and information products even without copyright.

¹¹ See Rochelle Dreyfuss, *Does IP Need IP? Accommodating Intellectual Production Outside the Intellectual Property Paradigm*, 31 *CARDOZO L. REV.* 1437 (2010).

¹² Open source code or code that is freely distributed is responsible for most of the innovative programming powering the Internet, operating systems, and software. Leaving source code open has generated some of the most sophisticated developments in computer software, including, most notably, Linux and Apache, which pose a significant challenge to Microsoft in the marketplace. See WEBER, *OPEN SOURCE*, *supra* note 3, at 5.

¹³ See *infra* Part II.A.1 for the software industry’s contribution to the Indian economy.

¹⁴ This argument has been raised previously albeit in the context of the fashion industry. See C. Scott Hemphill & Jeannie Suk, *The Law, Culture, and Economics of Fashion*, 61 *STAN. L. REV.* 1147, 1152 (2009).

¹⁵ Robert L. Glass, *The Sociology of Open Source: Of Cults and Cultures*, 17 *IEEE SOFTWARE* 104, 104 (2000), available at <http://www.computer.org/portal/web/csdl/doi/10.1109/MS.2000.10027>.

¹⁶ *Id.* Some scholars argue that these creative endeavors flourishing without IP protections are based upon pre-existing IP regimes. See, e.g., Dreyfuss, *supra* note 11; Ronald J. Mann, *Commercializing Open Source Software: Do Property Rights Still Matter?*, 20 *HARV. J.L. & TECH.* 1 (2006) [hereinafter Mann, *Commercializing Open Source Software*]. For more details of this argument, see *infra* Part I.B.2.

Part of the problem is historical impossibility. Evidence of information production without IP protection, particularly from commercial industry, would be difficult to locate in the United States.¹⁷ As Ronald Mann argues: “[D]espite the contrary mythology of a golden age of IP freedom, it is not clear that there was any time when software was not protected [in the United States].”¹⁸ It is difficult to demonstrate the counterfactual: innovation and information production would have occurred in the United States even without IP rights.¹⁹

In this context, the experience of other countries in which significant production of software takes place is therefore instructive. In fact, India provides evidence from the commercial software industry that can precisely fill this gap. In recent years, India introduced laws providing copyright and patent protection for software (in 1995 and 2004 respectively). Thus, India’s legal history captures a “natural experiment” that tests the causal relationship between IP protection and developments in the software industry.²⁰ Moreover, after protecting software under patents in 2004, India withdrew the law that provided the patent cover in April 2005. This legal change simulates a second “experiment” to test whether a reduction in IP protection would affect the industry.²¹

¹⁷ Some scholars argue that even though the United States had copyright and patent laws on the books, the protection was, in fact, not particularly robust. For instance, they point out the United States only recognized copyright in works published in the country, and publishers could without fear of legal action publish foreign works without the permission of foreign authors. *See, e.g.*, LESSIG, *FREE CULTURE*, *supra* note 1, at 48. *See generally* LESSIG, *FREE CULTURE*, *supra* note 1 (arguing that protectionism was not part of “American culture” in the past).

¹⁸ Ronald J. Mann, *Do Patents Facilitate Financing in the Software Industry?*, 83 *TEX. L. REV.* 961, 972 (2005) [hereinafter Mann, *Financing*].

¹⁹ *See, e.g.*, Mann, *Commercializing Open Source Software*, *supra* note 16, at 3 (arguing it is difficult to analyze the problem of whether or not to abandon patents for software industry without quantifying the benefits that the commercial software industry derives from IP).

²⁰ *See* J. DiNardo, *Natural Experiments and Quasi-natural Experiments*, in *THE NEW PALGRAVE DICTIONARY OF ECONOMICS* (Steven N. Durlauf & Lawrence E. Blume eds., 2d ed. 2008) (“Natural experiments or quasi-natural experiments in economics are serendipitous situations in which persons are assigned randomly to a treatment (or multiple treatments) and a control group, and outcomes are analy[z]ed for the purposes of putting a hypothesis to a severe test; they are also serendipitous situations where assignment to treatment ‘approximates’ randomized design or a well-controlled experiment.”).

²¹ For a prior example of the empirical strategy of using a “second experiment” as a “double check,” see Bert Huang, *Lightened Scrutiny*, 124 *HARV. L. REV.* 1109, 1126 (2011).

The strong growth of the software industry in India makes the country a particularly apt site to test for the connection between IP protection and growth. Between 1993 and 2010, the software industry²² in India achieved the fastest growth rate in the world and emerged as a multi-billion dollar industry.²³ In addition, this industry is a key economic sector, accounting for over 6.1 percent of the gross domestic product (GDP) in fiscal year 2010.²⁴ The industry is well regarded, credited with playing a strong role in India’s economic rise and for refashioning India’s image worldwide. India emerged as the second-fastest growing economy in the world in 2008 and even posted the highest growth rate of 10.4 percent in 2010.²⁵

²² Note that in this Article, I use the word “software,” which is more prevalent in the United States, and provides uniformity and avoids confusion. In India, the industry uses “software,” “information technology,” and other terms synonymously, but there are no semantic differences that would affect the central thesis of this Article.

²³ See NASSCOM REPORT, THE IT BPO SECTOR IN INDIA: STRATEGIC REVIEW – 2011 5 (Sanketh Arouje ed., 2011).

²⁴ DUN & BRADSTREET INDIA REPORT, INDIA’S TOP ITES AND BPO COMPANIES 2010 (2010) [hereinafter DUN & BRADSTREET REPORT], available at <http://www.dnb.co.in/ITeSBpo2010/ITeSBPO.asp> (last visited May 5, 2011). The software industry’s contribution to India’s total exports grew from 4 percent to 26 percent from FY98 to FY10. See, e.g., N.R. Narayanmurthy, *The IT Industry has Given India Wings*, ECON. TIMES (Nov. 26, 2008), http://articles.economic-times.indiatimes.com/2008-11-26/news/27705078_1_software-industry-industry-leaders-corporate-governance. See *Economy of India*, WIKIPEDIA, http://en.wikipedia.org/wiki/Economy_of_India (last visited Apr. 7, 2011). For instance, Infosys Technologies Ltd., one of India’s leading software firms was founded in India in 1981 with \$250. Infosys became listed on the NASDAQ within two decades of its inception and earned \$6.04 billion in the first quarter of 2011. *What We Do*, INFOSYS, <http://www.infosys.com/about/what-we-do/pages/index.aspx> (last visited May 2, 2011).

²⁵ India’s growth rate in 2010 surpassed even China’s growth rate by 0.1 percent, according to the International Monetary Fund’s World Economic Outlook. See IMF, *World Economic Outlook: Tensions from the Two-Speed Recovery*, WORLD ECONOMIC AND FINANCIAL SURVEYS 20 (2011), available at <http://www.imf.org/external/pubs/ft/weo/2011/01/pdf/text.pdf>. See also *The X factor: Which of Asia’s Emerging Giants Grew Faster in 2010?*, ECONOMIST (Apr. 20, 2011), <http://www.economist.com/node/18586836>; Amartya Sen, *Quality of Life: India v. China*, N.Y. REV. BOOKS (May 12, 2011), available at <http://www.nybooks.com/articles/archives/2011/may/12/quality-life-india-vs-china/>; DAVID SMITH, *THE DRAGON AND THE ELEPHANT: CHINA, INDIA AND THE NEW WORLD ORDER* (2007); Martin Wolf, *India’s Elephant Charges on through the Crisis*, FIN. TIMES (Mar. 2, 2010), <http://cache.ft.com/cms/s/0/750747e0-262c-11df-aff3-00144feabdc0.html-axzz1Dg7FK3Yi>; *Lehman collapse: India’s Economic Elephant is Still on the Move 12 Months On*, TELEGRAPH (Sept. 15,

In this Article, data and analysis are provided to address the important question of the connection between strong IP protection and growth in software, an industry that thrives on innovation. It joins other industry case studies—on fashion, stand-up comedy, and recipes—in questioning whether IP law is appropriate for that particular industry.²⁶ This Article has important implications for the larger debate on whether strong IP protection fuels growth. But it is not argued that IP protection is irrelevant in all contexts. It may well be pertinent to pharmaceuticals or industries with high research and development (R&D) costs.²⁷ This Article simply inquires whether the software industry depends upon copyright, and the claims in this Article are limited to the software industry.²⁸

2009), <http://www.telegraph.co.uk/finance/financetopics/financialcrisis/6183664/Lehman-collapse-Indias-economic-elephant-is-still-on-the-move-12-months-on.html>; Nicholas Vardy, *The Elephant Awakes: The Remarkable Rise of India*, GLOBAL GURU (Apr. 8, 2008), <http://www.theglobalguru.com/article.php?id=193&offer=GURU>.

²⁶ For a case study on the role of IP in the fashion industry, see Hemphill & Suk, *supra* note 14, at 1151 (arguing “for a limited right against design copying”); Kal Raustiala & Christopher Sprigman, *The Piracy Paradox: Innovation and Intellectual Property in Fashion Design*, 92 VA. L. REV. 1687 (2006). For other examples, such as stand-up comedy and cuisine, see Dotan Oliar & Christopher Sprigman, *There’s No Free Laugh (Anymore): The Emergence of Intellectual Property Norms and the Transformation of Stand-up Comedy*, 94 VA. L. REV. 1787 (2008); Christopher J. Buccafusco, *On the Legal Consequences of Sauces: Should Thomas Keller’s Recipes Be Per Se Copyrightable?*, 24 CARDOZO ARTS & ENT. L.J. 1121 (2007). For a discussion on authors’ incentives in the digital age, see Diane Zimmerman, *Authorship Without Ownership: Reconsidering Incentives in a Digital Age*, 52 DEPAUL L. REV. 1121 (2003). *See also* Diane Zimmerman, *Living Without Copyright in a Digital World*, 70 ALB. L. REV. 1375 (2007).

²⁷ *See* Mann, *Commercializing Open Source Software*, *supra* note 16; Dreyfuss, *supra* note 11.

²⁸ This Article shall confine the patent study in order to support the main findings with regard to the limited reliance that the software industry places on copyright and IP. This Article does not intend to make any other sweeping or general universal claims with regard to patent law. Software patent protection in India has been included solely for the purpose of completeness, avoiding a potential objection. Readers may think perhaps the reason copyright protection does not affect the software industry is because the industry is counting on alternate IP protection. In the aforementioned Parts II.B.2 and 3, I demonstrate this is also not true. For criticisms against industry studies that only consider one form of IP (for instance, fashion industry studies that only evaluated copyright and not trademarks, which are hugely relevant to that industry), see Dreyfuss, *supra* note 11, at 1450.

This Article will proceed as follows: Part I.A will outline the bedrock issues of, and conflict between, technology and copyright law in the United States. Part I.B will examine newer theories put forth on the basis of open-source and non-commercial sector performance. Even though this Article focuses on software, it will examine theories emerging from various creative endeavors (Internet Theories) over and above software examples. The critical analysis in this Part identifies significant gaps in these theories that prevent the supporting studies from being persuasive evidence of “IP without IP.” The strong-copyright camp points out open-source projects are based on incentives structures and *a priori* IP. Programmers and firms gain benefits from participating in open software—programmers are able to signal to future employers supplementary skills they possess and firms are able to increase market share.²⁹ Moreover, Professors Ronald Mann and Rochelle Dreyfuss respectively point to two conclusions: (a) open software is in fact supported by monetary and other contributions from proprietary software firms,³⁰ and (b) open software is based on the attribution norm, which is predicated on a pre-existing IP regime.³¹ In other words, programmers exercise rights and participate in open software development on the basis of prior IP rights, negating open software as evidence of information production without IP. Thus, even though these Internet Theories show progress, they fail to provide clear evidence of “IP without IP” that judges and legislators alike seek in order to limit copyright expansions.³²

Part II will provide evidence of “IP without IP” from the commercial software industry in India. This data provides an additional benefit—because it stems from commercial industry, unlike the other examples from the non-commercial sector, this evidence cannot be dismissed as an exception (or “cult”). As for the data, it is plain and essentially tells the story: the industry growth rate did not surge when copyright and patent protections were introduced for software in 1995 and 2004 respectively. The picture that emerges shows industry growth is unaffected by changes in IP protection. One objection may be the clichéd cost advantage. Software may be booming in India because of cheap labor or lower-end back-office services.³³ Another objection is that the Indian software industry perhaps does not produce patent- or

²⁹ See, e.g., Mann, *Commercializing Open Source Software*, *supra* note 16.

³⁰ Dreyfuss, *supra* note 11.

³¹ *Id.*

³² Dreyfuss argues these are actually predicated on pre-existing IP protections, pointing toward the strong emphasis on attribution norm, for instance. For details, see *infra* Part II.A.3.

³³ See *infra* Part II.A.3.

copyright-worthy products. In Parts II.A.5 and II.B generally, I will discuss and disprove such anticipated objections to this data.

The withdrawal of patent protection in April 2005 allows us to test a second and related hypothesis—that industry will remain unaffected by a *decrease* in IP protection. The industry growth rate showed no fall after the withdrawal of patents. Remarkably, industry was silent and did not endorse patents or any other increase in IP. Interpreting silence is usually difficult, but in this case it corroborates our growth data and helps to eliminate several anticipated objections, which shall be discussed in Part II.B. Indeed, it is hard to argue that industry depends upon IP protection, and yet does not protest a decrease in IP protection.

Though this Article focuses on copyright law, including patents in this study provides us another benefit. We can consider and eliminate patent as an alternate causal story. Critics could argue industry perhaps gains more from patents, and hence, the lack of copyright royalties or effect may be misleading.³⁴ Thus, I avert the incomplete analysis objection that critics have leveled against other industry studies in the past.³⁵ The Indian commercial industry indicia reveal that it places limited or no reliance on copyrights or patents.

In addition to answering the gap in American literature, the data from the commercial industry in India provides one more gift: it prevents scholars from confounding causality with outcomes in emerging U.S. studies. Leading American legal scholars are turning up information indicating that software firms in the United States prize tacit knowledge rather than formal IP rights. But as a second step, these studies trace causality to other laws. Some scholars, for instance, identified causation in remote California state laws, such as the non-enforceability of postemployment covenants not to compete, because the industry flourished in California's Silicon Valley while it atrophied in Massachusetts. India reveals near-identical geographical agglomeration but without any differences in postemployment restrictions. The comparative analysis thus enables us to distinguish correlation from causation and prevents second-order errors.

Until now, scholars have turned toward “serendipity” or “historic accident” to explain why the software industry developed where it did

³⁴ See, e.g., Dreyfuss, *supra* note 11, at 1450 (pointing out Raustiala & Sprigman's study on the fashion industry, for instance, included copyright but not trademark—an omission that, according to Dreyfuss, was a significant error) (citations omitted).

³⁵ *Id.*

while it atrophied in other regions.³⁶ Legal scholars offer a more nuanced argument: they attribute Silicon Valley’s success to “a serendipitous result of the historic coincidence” of a 1870s California prohibition that made postemployment covenants unenforceable, for instance.³⁷ In other words, the legal infrastructure available by historic accident was the critical differentiating factor for high technology districts.

The software industry in India provides one more gift: illuminating contracting practice. The contracting practice that software firms employ provides strong evidence that firms encourage transfer of know-how within a region. Startlingly, these firms prohibit spillovers of know-how to clients in other regions. This contracting practice however opens the door to proceed beyond “serendipity” or “historic accident” accounts, or beyond searching for ex post justifications in remote laws. The data from India provides decisive evidence of the legal infrastructure needs of software firms, which firms will *by contract* create if it is not *a priori* available under existing law. Sorting through the web of these contracts and a fine-grained analysis of the incentives that drive software firms at the global and regional level are left for future work.

I. THE INTERNET CHALLENGES COPYRIGHT’S EMPIRE

Copyright and Internet technologies share a complex transformative relationship. On the one hand, the Internet threatens to reduce copyright to a relic of the printing press era, and on the other, copyright liability has become the arbiter of the future of Internet technologies.³⁸ These technologies are now so salient that technology is

³⁶ See, e.g., ANNALEE SAXENIAN, REGIONAL ADVANTAGE: CULTURE AND COMPETITION IN SILICON VALLEY AND ROUTE 128 (1994) [hereinafter SAXENIAN, REGIONAL ADVANTAGE] (attributing the business culture in California which created conditions conducive for high-velocity mobility as the reason software succeeded in California while atrophying in Massachusetts). See generally W. Brian Arthur, ‘Silicon Valley’ Locational Clusters: When Do Increasing Returns Imply Monopoly?, 19 MATH. SOC. SCI. 235 (1990).

³⁷ See, e.g., Ronald Gilson, *The Legal Infrastructure of High Technology Districts: Silicon Valley, Route 128, and Covenants Not to Compete*, 74 N.Y.U. L. REV. 575, 611 (1999) [hereinafter Gilson, *High Technology Districts*]. As Gilson demonstrates, the case law does not support the premise that the two states in question employ different standards.

³⁸ For a discussion on how *MGM v. Grokster*, 545 U.S. 913 (2005) chills innovation, see, e.g., Rob Hof, *Larry Lessig: Grokster Decision Will Chill Innovation*, BUS. WK. ONLINE (June 28, 2005), http://www.businessweek.com/techbeat/archives/2005/06/larry_lessig_gr.html; Fred von Lohmann, *Remedying Grokster*, LAW.COM (July 25, 2005), <http://www.law.com/jsp/article.jsp?id+1122023112436>. See also *MGM v. Grokster*, 545 U.S. 913 (2005); *A&M Records v. Napster*, 239 F.3d 1004 (9th Cir. 2001); *In re Aimster*, 334

no longer of interest to only copyright scholars.³⁹ Indeed, Internet issues now animate the work of scholars ranging from constitutional law experts like Cass Sunstein⁴⁰ and Jack Balkin,⁴¹ to corporations and securities law professor Ronald Gilson,⁴² to polymaths Richard Epstein⁴³ and Richard Posner.⁴⁴ Today, copyright involves and impacts not only Walt Disney but Main Street too. The range of amicus curiae briefs submitted by people from all walks of life in *Eldred* illustrates the variety of issues at stake, wide interest, and current engagement with copyright law.⁴⁵

This Part will spotlight the Internet-copyright relationship and will proceed as follows. Part I.A will provide a brief background to the issues in American copyright law, touching lightly upon the constitutional provision and the conflict between Internet technology and copyright. Part I.B will discuss another dimension of the relationship

F.3d 643 (7th Cir. 2003); LESSIG, *FREE CULTURE*, *supra* note 1 (showing how the Internet is enabling more control).

³⁹ See, e.g., Mark Lemley, *Is the Sky Falling on the Content Industries?*, 9 J. TELECOMM. & HIGH TECH. L. 125, 125 (2011); Pamela Samuelson, *Should Copyright Owners Have to Give Notice Of Their Use of Technical Protection Measures?*, 6 J. TELECOMM. & HIGH TECH. L. 41, 42 (2007).

⁴⁰ See CASS SUNSTEIN, *INFOTOPIA: HOW MANY MINDS PRODUCE KNOWLEDGE*, 147 (2006) (discussing Wikipedia and open software). See also CASS SUNSTEIN, *REPUBLIC 2.0* (2007) (arguing that people are increasingly deploying the Internet to filter the information they receive. Indeed, they increasingly speak with and listen to only like-minded opinions.).

⁴¹ See, e.g., Balkin, *supra* note 4.

⁴² See Gilson, *High Technology Districts*, *supra* note 37. See also Ronald Gilson, Charles Sabel & Robert E. Scott, *Braiding: The Interaction of Formal and Informal Contracting in Theory, Practice, and Doctrine*, 110 COLUM. L. REV. 1377 (2010).

⁴³ See Richard A. Epstein, *Liberty Versus Property? Cracks in the Foundations of Copyright Law*, 42 SAN DIEGO L. REV. 1 (2005).

⁴⁴ See Richard Posner, *The Future of Newspapers*, THE BECKER-POSNER BLOG (June 23, 2009), <http://www.becker-posner-blog.com/2009/06/the-future-of-newspapers--posner.html>. See also William Landes & Richard Posner, *Indefinitely Renewable Copyright* (U. Chi. Law & Econ., Olin Working Paper No. 154, 2002), available at <http://ssrn.com/abstract=319321>.

⁴⁵ LESSIG, *FREE CULTURE*, *supra* note 1, at 124–25 (“In the Supreme Court, the briefs on our side were about as diverse as it gets.”) Lessig proceeds to document historical briefs submitted by the Free Software Foundation, law professors, libraries, archives, and economists. *Id.* (“But two briefs captured the policy argument best. . . . A brief by Hal Roach Studios argued that unless the law was struck: a whole generation of American film would disappear. The other made the economic argument absolutely clear”). See also *Eldred v. Ashcroft*, 537 U.S. 186 (2003) (containing amicus curiae briefs submitted by 17 economists).

between Internet technologies and copyright—the Internet’s potential to limit copyright’s domains. More recent scholarship focuses on this aspect of the Internet-copyright relationship in a bid to gather proof that creative work will be produced even without strong IP protection. Scholars draw upon open software and other creative endeavors that are flourishing online without strong IP protections as evidence of “IP without IP” (Internet Scholars and Internet Projects, respectively).

However, no theory espoused so far on the basis of these non-commercial Internet Projects has been able to provide a coherent explanation for the different types of creative endeavors flourishing online, as shall be demonstrated in Part I.B.1. In other words, the theories put forth thus far are so narrow and limited that, at best, they are able to explain one or two Internet Projects. Advocates of stronger copyright point out, moreover, programmers and software firms participate in open software development to increase future employment prospects and market share—hence, profit remains the incentive for writing code. Part I.B.2 will discuss the chief flaws advocates of stronger copyright point out in Internet Theories. Part I.B.3 will bring out the logical gap in the criticism that advocates of stronger copyright level against Internet Theories. Advocates of stronger copyright have incorrectly collapsed the distinction between commerce and property while criticizing Internet Scholars. As Lessig points out in a related context, such logical distinctions may be theoretically relevant, but are not useful to limit such expansions in copyright.⁴⁶ Judges still require evidence of information production that would occur even without copyright, leading to Part II, which will in detail provide evidence of “IP without IP.” The distinction drawn between property and monetary incentives in Part I.B.3 provides an important benefit for the analysis that follows in Part II—*in limine*, a potential logical objection to separating monetary and property motivations is eliminated.

A. Bedrock Issues

Some of the problems in U.S. copyright law can be traced back to its constitutional roots and its very origins. The constitutional provision empowering Congress to legislate to protect IP—Article I, Section 8—utilizes a paradoxical scheme: it intends to increase *public access* to creative works by providing *private property incentives*, creating the first source of conflict.⁴⁷ Providing private power to control

⁴⁶ See LESSIG, *FREE CULTURE*, *supra* note 1, at 128 (discussing the difference between a right and correct answer on the evidence needed for judges to be willing to hold expansive copyright unconstitutional).

⁴⁷ Article I, Section 8 of the United States Constitution gives Congress the power “to promote the Progress of Science and useful Arts, by securing for

content and speech creates conflicts with the First Amendment, and becomes the second source of tension.⁴⁸

Thus, there is much scholarly debate between critics of copyright on the one hand and advocates of stronger copyright on the other. These scholars are occupied by the inquiry “*does copyright fulfill its avowed aims?*” Copyright critics may be broadly divided into two groups: (a) those who argue that copyright does not incentivize information production (Copyright Skeptics)⁴⁹ and (b) those who support copyright

limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.” U.S. CONST. art. I, § 8, cl. 8. For American history of copyright, see LYMAN RAY PATTERSON, *COPYRIGHT IN HISTORICAL PERSPECTIVE* (1968). For a discussion on the utilitarian basis of copyright, see Keith Aoki, *(Intellectual) Property & Sovereignty: Notes toward a Cultural Geography of Authorship*, 48 STAN. L. REV. 1293, 1333–38 (1996); Mark Lemley, *Romantic Authorship and the Rhetoric of Property*, 75 TEX. L. REV. 873 (1997); ROBERT GORMAN & JANE GINSBURG, *COPYRIGHT: CASES AND MATERIALS* 14 (2006). *See also* H.R. REP. No. 52-1494, at 2 (1892) (“There is nothing said [in the Constitution’s Copyright and Patent clause] about any desire or purpose to secure to the author or inventor his ‘natural right to his property.’”); *Mazer v. Stein*, 347 U.S. 201, 219 (1954). Although the United States has recognized limited moral rights under Visual Artists Rights Act, such instances are exceptions to the general rule.

⁴⁸ C. Edwin Baker, *First Amendment Limits on Copyright*, 55 VAND. L. REV. 891, 892 (2002) (“The Constitution specifically authorizes Congress to provide for copyrights. A copyright grants its holder the power to stop other people—non-copyright holders—from saying certain things or distributing certain messages. A legislative grant of this private power to stop speech on the basis of its content is in overt tension with the constitutional guarantees of speech and press freedom.”). Courts also articulate another approach: copyright law has built-in First Amendment safeguards and does not require further First Amendment scrutiny, which has been criticized by several legal scholars. *See, e.g.*, Yochai Benkler, *A Political Economy of the Public Domain*, in *EXPANDING THE BOUNDARIES OF INTELLECTUAL PROPERTY* 267, 287 (Rochelle Dreyfuss et al. eds., 2001) [hereinafter Benkler, *A Political Economy of the Public Domain*].

⁴⁹ *See, e.g.*, Benkler, *A Political Economy of the Public Domain*, *supra* note 48, at 291 (arguing that copyright has been deployed to make markets in information goods possible. Therefore, “governments must prevent many of their constituents from reading and speaking in ways that would be beneficial and feasible to them. This choice, to sacrifice individual interests in using information to further the social policy goal of making markets in information goods, raises serious normative concerns in liberal democracies”). *See generally* Michael Heller, *The Tragedy of the Anticommons: Property in the Transition from Marx to Markets*, 111 HARV. L. REV. 621 (1998). For economic arguments against copyright, see Michele Boldrin & David K. Levine, *Against Intellectual Monopoly*, *ECONOMICS AND GAME THEORY* (Nov. 11, 2005), <http://levine.sscnet.ucla.edu/general/intellectual/against.htm>. For libertarian economic

protection as a general rule but oppose the current trend of expansions as inimical to progress.

Copyright Skeptics draw support from historical accounts of the European Renaissance, when unsurpassed innovation and creative works flourished. Copyright Skeptics point out that the Renaissance was spurred by artists who were able to copy each other’s techniques and work, without any legal restrictions.⁵⁰ However, Copyright Skeptics argue, under the guise of ensuring progress and the greater common good, that copyright law mainly protects the incomes and wealth of copyright holders.

In contrast to Copyright Skeptics, expansion critics believe copyright protection incentivizes creative expression as a general rule. However, these critics oppose the current trend of expansion as not conducive to progress and divorced from the original constitutional mandate.⁵¹ The expansion critics at this juncture part company with the traditional law and economics scholars who prescribe full protection of

arguments, see STEPHAN KINSELLA, *AGAINST INTELLECTUAL PROPERTY* (2008), available at <http://mises.org/books/against.pdf>. For a simple overview of copyright critics’ landscape, especially in America, see *Philosophy of Copyright*, WIKIPEDIA, http://en.wikipedia.org/wiki/Philosophy_of_copyright (last visited Feb. 11, 2011). Note that several groups ranging from traditional anarchists like Leo Tolstoy to economists to libertarians have been arguing against copyright. See generally *Anti-Copyright*, WIKIPEDIA, <http://en.wikipedia.org/wiki/Anti-copyright> (last visited Feb. 11, 2011).

⁵⁰ See LESSIG, *FREE CULTURE*, *supra* note 1, at 44 (arguing the history of the content industry in the United States is a history of piracy). See also JESSICA LITMAN, *DIGITAL COPYRIGHT* 11–14, 15–19 (2001) (arguing that American ideas of freedom are linked to free information policy and laying out the basics of U.S. copyright); Salil K. Mehra, *Copyright and Comics in Japan: Does Law Explain Why All the Comics My Kid Watches Are Japanese Imports?* 55 *RUTGERS L. REV.* 155 (2002); Rochelle Dreyfuss, *Expressive Genericity: Trademarks as Language in the Pepsi Generation*, 65 *NOTRE DAME L. REV.* 397 (1990) (arguing against expansions in IP because it has become a “if value then right” principle, albeit in the context of trademarks); *Anti-Copyright Definition*, WORDIQ.COM, <http://www.wordiq.com/definition/Anti-copyright> (last visited Jan. 12, 2011).

⁵¹ Benkler, *A Political Economy of the Public Domain*, *supra* note 48. See, e.g., LESSIG, *FREE CULTURE*, *supra* note 1, at 78 (“I doubt whether the framers would recognize the regulation we call ‘copyright’ today. The scope of that regulation is far beyond anything they ever considered.”). See also *id.* at 128 for Justice O’Connor’s question to Lessig in oral hearings for *Eldred v. Ashcroft*, 537 U.S. 186 (2003) (“She was quite willing to concede that ‘this flies directly in the face of what the framers had in mind.’”).

IP.⁵² Expansion critics are opposed to further increases in copyright protection, such as additions in subject matter, scope, and term or duration.⁵³

Advocates of stronger copyright argue that the changes merely ensure prior rights are not whittled away by the new technologies.⁵⁴ They have argued that they are merely looking to preserve the traditional balance of rights, permissions, and prohibitions,⁵⁵ but this argument is raised less frequently now. Even ardent advocates of stronger copyright concede copyright's empire has been expanded by these cumulative

⁵² See, e.g., WILLIAM M. LANDES & RICHARD A. POSNER, *THE POLITICAL ECONOMY OF INTELLECTUAL PROPERTY LAW* 1 (2004).

⁵³ See, e.g., Lawrence Lessig, *The Architecture of Innovation*, 51 DUKE L.J. 1783, 1792–99 (2002) (arguing the original copyright “law was slight, as was the actual scope of protection.” Lessig further argues, “[t]his tiny regulation of a tiny proportion of the extraordinary range of creative work in 1790 has morphed into this massive regulation of everyone who has any connection to the most trivial of creative authorship.” Lessig points out the rights have been increased to include derivative works, translations, and the subject matter covered now includes music, performances, software, and Internet works. The protected term has also been increased from the initial term of fourteen years to the author’s life plus seventy.). As discussed earlier, term extensions were challenged in *Eldred*, 537 U.S. at 186.

⁵⁴ For arguments involving the DMCA, see, e.g., Jane C. Ginsburg, *Legal Protection of Technological Measures Protecting Works of Authorship: International Obligations and the US Experience*, NELLCO LEGAL SCHOLARSHIP REPOSITORY (Aug. 2005), http://lsr.nellco.org/columbia_pllt/0593 (“As many commentators and other authorities have recognized, in the digital environment, the ease of copying may render legal protection *simpliciter* inadequate. In the past, copying technology was too rudimentary, cumbersome or expensive to enable users to copy and disseminate on the scale that digital media make possible. Copyright law’s prohibitions thus generally sufficed, because rights holders could enforce the law against the commercial intermediaries who engaged in large scale copying and dissemination while whatever copying end users engaged in was unlikely to rival the copyright owner’s control of markets for the work. When digital media changed the technological balance, they also altered legal relationships, for now economically significant infringing acts were no longer the sole province of entities higher up the distribution chain. To redress this shift, it might be necessary to reinforce the legal prohibition with a layer of technical protection, disabling end users from availing themselves of some of the copying technology’s potential for reproducing or redistributing copyrighted works.”). See also Senator Orrin Hatch, *Introduction of the Copyright Term Extension Act of 1997*, COPYRIGHTEXTENSION.COM (Mar. 1997), <http://www.copyrightextension.com/page04.html> (arguing that copyright term extensions are needed because life expectancy has changed).

⁵⁵ See, e.g., Ginsburg, *supra* note 54.

changes in law.⁵⁶ However, they defend the expansions on other grounds.⁵⁷ But as Copyright Skeptics and critics of expansion argue, expansive copyright and the cumulative effects of such increases in property rights are deeply worrying.⁵⁸

A vast majority of legal scholars are now concerned about the impact copyright law will have on new technology and fear that extending—to the Internet—a law that was intended to tackle the printing press has put free speech values and innovation at risk. Peter Menell and David Nimmer,⁵⁹ for instance, recognized that on the one hand, the indirect copyright liability standard (derived by the U.S. Supreme Court in *Sony Corp. of America v. Universal City Studios, Inc.* from patent law and reasserted in *Metro-Goldwyn-Mayer Studios Inc. v. Grokster, Ltd.*) created “a safe harbor for distributors of dual-use technologies.”⁶⁰ On the other hand, the subsequent developments have all headed in the opposite direction.⁶¹ Menell and Nimmer argue that *Sony* created a safe harbor for distributors of dual-use technologies “[b]ecause

⁵⁶ See e.g., LANDES & POSNER, *supra* note 52.

⁵⁷ *Id.*

⁵⁸ For discussion on copyright expansions in rights or scope, subject matter and duration, see Lessig, *supra* note 53. Moreover, copyright has also been expanded through broader considerations on what constitutes infringement. These include: (a) the new standard in *MGM v. Grokster*, 545 U.S. 913 (2005), which departed from the prior standard laid down in *Sony Corp. v. Universal City Studios, Inc.*, 464 U.S. 417 (1984), and had resulted in a chilling of new technologies; (b) the reversal of the tradition of fair use; and (c) permissible imitation, which is essential for creation. See e.g., James Boyle, *Fencing Off Ideas: Enclosure and the Disappearance of the Public Domain*, in CODE: COLLABORATIVE OWNERSHIP AND THE DIGITAL ECONOMY, 235, 243 (Rishab Aiyer Ghosh ed., 2005) (discussing how the recent standards have whittled down permissible fair-use); Rebecca Tushnet, *Copy This Essay: How Fair Use Doctrine Harms Free Speech and How Copying Serves it*, 114 YALE L.J. 535, 555 (2004) (arguing imitation is necessary for creativity by stating that “fair use has become such a thin reed on which to rest claims that copyright does not threaten freedom of expression”); Jane C. Ginsburg, *US Initiatives to Protect Works of Low Authorship*, in EXPANDING BOUNDARIES OF INNOVATION POLICY 55 (Rochelle Dreyfuss et al. eds., 2001) (discussing the expansion of copyright to now include works of low authorship).

⁵⁹ Peter S. Menell & David Nimmer, *Legal Realism in Action: Indirect Copyright Liability’s Continuing Tort Framework and Sony’s De Facto Demise*, 55 UCLA L. REV. 143 (2007).

⁶⁰ *Id.* at 143 (citations omitted). Dual-use technologies are technologies that can be deployed for infringing and non-infringing uses.

⁶¹ *Id.* (“Yet, when one looks to cases decided since *Sony*, subsequent legislative enactments, and post-*Sony* decisions of technology companies in the marketplace, a different reality emerges.”).

it immunized from contributory liability not only the makers of the proto-VCR involved in that case (Sony's Betamax), but also manufacturers of any technology that is "merely . . . capable of substantial noninfringing use." This safe harbor became the central organizing force for "product innovation" and the "technology age."⁶² Yet, Menell and Nimmer argue that "legal realism" exposes a very different "practical reality."⁶³

With but one exception (itself effectively overruled by later amendment), no reported decision has found the *Sony* safe harbor to immunize a technology company accused of indirect liability. In fact, the developers and distributors of Napster, Aimster, Grokster, Morpheus, and KaZaA—peer-to-peer systems that have noninfringing uses—have all been held liable for contributory infringement, *Sony* notwithstanding. Nor has the U.S. Congress adhered to *Sony*; instead, its amendments [passed] since that case was handed down have expanded copyright liability to reach technologies that are capable of dual use. Technology companies (such as YouTube, BitTorrent, TiVo, and ReplayTV) behave as though they bear responsibility for system designs that create an unreasonable risk of copyright infringement by users of their technology.⁶⁴

In short, copyright owners, such as large publishing houses and film studios, require a "no-leaks guarantee" as Internet technologies develop.⁶⁵ Lessig provides a live example, from the District Court's proceedings in *Napster*, of judges requesting a "no-leaks guarantee," or "zero tolerance" as he calls it.⁶⁶

When Napster told the district court that it had developed a technology to block the transfer of 99.4 percent of identified infringing material, the district court told counsel for Napster 99.4 percent was not good enough. Napster had to push the infringements "down to zero." If 99.4 percent is not good enough, then this is a war on file-sharing *technologies*, not a war on *copyright infringement*.⁶⁷

⁶² *Id.* (citations omitted).

⁶³ *Id.*

⁶⁴ *Id.* at 145 (citations omitted).

⁶⁵ For similar argument, "zero tolerance," and how this was historically not American "culture," see LESSIG, *FREE CULTURE*, *supra* note 1, at 53–54, 101.

⁶⁶ *Id.*

⁶⁷ LESSIG, *FREE CULTURE*, *supra* note 1, at 53–54 (emphasis added) ("There is no way to assure that a p2p system is used 100 percent of the time in compliance with the law, any more than there is a way to assure that 100 percent of VCRs or 100 percent of Xerox machines or 100 percent of handguns are used in

The no-leaks guarantee has been transformed into a sword, extending monopolies far beyond the privilege initially contemplated. The Internet vastly enhances the exercise of free speech rights⁶⁸ and, in the process, may also be used to create an infringing copy. The question is whether it is appropriate to prohibit the use of an entire technology to ensure there is no leak in the property basket. Hence, even *arguendo*, if we accept the current demand is only to extend to the Internet the basket of rights available under traditional media,⁶⁹ it is effectively a demand to prohibit technology. Another concern is that copyright was intended to prevent counterfeiters from denying authors the profits from identical prints (enabled by printing press), and not to provide a monopoly in adjacent goods or to curb emerging technologies.⁷⁰ In that light, is it appropriate for a law created in response to problems arising from printing press technology to now be deployed to chill new technologies?

In sum, critics of copyright expansion and Copyright Skeptics worry that, with liability now attached to technology, many non-infringing uses will be lost. Expansion critics worry about the consequences of this unequal trade-off; substantive rights may be disproportionately sacrificed to protect against a potential leak in the property basket.

Loss of substantive rights and non-infringing uses is one aspect of the tension between the Internet and copyright. Another aspect of the Internet-copyright conflict is made latent by more recent scholarship. Scholars draw on open software (and other Internet Projects that are flourishing without strong IP protection) to gather evidence of innovation and creative work that will flourish even without copyright. In other words, these studies intend to place limits on copyright expansions. Part

compliance with the law. Zero tolerance means zero p2p. The court’s ruling means that we as a society must lose the benefits of p2p, even for the totally legal and beneficial uses they serve, simply to assure that there are zero copyright infringements caused by p2p.”). See *id.* at 164 n.17 for details of transcript of proceedings.

⁶⁸ For claims of advocates of stronger copyright, see *supra* p. 45–46.

⁶⁹ See, e.g., *MGM v. Grokster*, 545 U.S. 913 (2005); *A&M Records v. Napster*, 239 F.3d 1004 (9th Cir. 2001). Lessig argues the rule laid down in the two aforementioned cases differs from the rule in *Sony Corp. v. Universal City Studios, Inc.*, 464 U.S. 417 (1984). See also LESSIG, *FREE CULTURE*, *supra* note 1 (arguing that, in *Sony-Betamax*, we made the decision to allow VCR sales even though by allowing sale of recording technology, we would have potentially enabled the creation of some infringing copies). For detailed discussion, see *supra* note 58 and accompanying text.

⁷⁰ Aarthi S. Anand, *Copyright Challenges in the Digital Era*, HINDU (Dec. 29, 2008), <http://www.hindu.com/2008/12/29/stories/2008122955250800.htm>.

I.B will analyze this aspect, the use of Internet Projects, and associated experience to establish boundaries for copyright's empire.

B. Internet Theories Attempt to Limit Copyright

Recent legal scholarship focuses on creative endeavors flourishing online without strong IP protection. Internet Scholars are studying and mining Internet Projects to uncover evidence of "IP without IP" that judges seek in order to limit copyright's expanding empire. If the Internet Scholars had succeeded, they would have shifted the burden of proof to advocates of stronger copyright to prove the need for increases in IP protection. Though this Article focuses on software, in this Part, the important theories emanating from creative work in general (in addition to software) will be analyzed, ensuring completeness and fuller treatment of the existing literature.

Internet Scholars have based their theories on various open software and other creative online endeavors. But in relying on such theories to place limits on copyright, these scholars have been drawn into two cardinal errors. The first error is as follows. Internet Scholars attempt to craft a general "theory" on the basis of studying one or two Internet Projects. The "theory" is then applied to that one (or two) Internet Project(s), but is unable to explain other equally sharp examples of creative work flourishing online without strong IP protection. The second error springs from the requirement of altruistic motivation. Internet Scholars have also been drawn into establishing that software programmers are motivated by altruism, which advocates of stronger copyright counter easily. Advocates of stronger copyright argue such instances are exceptions and unique cults, while proprietary software is the norm. Advocates of stronger copyright point out, moreover, programmers and software firms participate in open software to increase future employment prospects and market share—hence, profit remains the incentive for writing code. This Part will flesh out this landscape in detail and will proceed as follows. Part I.B.1 will discuss the various Internet Theories espoused, and point out the intrinsic limitations of each. Part I.B.2 will demonstrate the extrinsic defects in Internet Theories that advocates of stronger copyright point toward, and which Internet Scholars are unable to overcome. Part I.B.3 will lightly touch upon the logical gap in the criticism that advocates of stronger copyright level against Internet Theories. Advocates of stronger copyright have incorrectly collapsed the distinction between commerce or monetary motivation on the one hand, and property on the other. This distinction establishes there is no logical barrier to the central thesis in the Article—that software and information products will not cease to be produced if more property rights were not granted.

1. Many “Whys,” Yet No Theory

This Part will study the current efforts and the barriers that Internet Theories face and have to overcome in order to place limits on copyright law. All the Internet Theories drawn on so far from the non-commercial sector fail to overcome the intuition that property rights encourage production. The first barrier that Internet Scholars face is establishing that the Internet is so unique and different from the real (or brick-and-mortar) world that monetary gains would discourage, or are a non-incentive for, production. In order to do so, Internet Scholars are compelled to take either of the following tacks: (a) the Internet has unique characteristics such that non-commercial motivations fuel creative expression, or (b) there is some parallel with an obscure phenomenon in the brick-and-mortar world.

Risabh Ghosh, for instance, takes the former approach and characterizes this special feature of the cyberspace environment as “non-monetary economics” of the “cooking-pot model,” “where access to a vast collection of diverse resources—people, goods, or information—is more valuable to people participating in this system than the cost of their own work.”⁷¹ Steven Weber champions a related theory, focusing on “antirivalness,” another feature of open source projects.⁷² Weber defines “antirivalness” as the “positive network externalities” that operating systems like Linux and software in general gain.⁷³ Software is characterized by “antirivalness”: the value that a user derives from any part of the software program increases when a greater number of people use it. Gains stem from compatibility, easier communication, and sharing advantages.⁷⁴ Weber argues that open source software brings down the cost of maintenance and debugging (typically a large percentage of the total cost for software).⁷⁵ Weber argues Ghosh’s cooking-pots analogy

⁷¹ Rishab Aiyer Ghosh, *Cooking-Pot Markets and Balanced Value Flows*, in CODE: COLLABORATIVE OWNERSHIP AND THE DIGITAL ECONOMY 153, 153–54 (Rishab Aiyer Ghosh ed., 2005).

⁷² WEBER, OPEN SOURCE, *supra* note 3, at 153–54. *See id.* at 131 (advising “to steer clear of altruism as a principal explanation” and side-stepping this in favor of focusing “more cleanly on what mix of individual motivations are at play.”). Weber also opts out of the uniqueness of the Internet plank. *See id.* at 13 (arguing that multiple motivations exists within the open source community and “none of them is unique to that community or distinctive to the Information Age.”).

⁷³ *Id.* at 154.

⁷⁴ *Id.*

⁷⁵ *Id.* Lessig also raises a similar argument (and somewhat less persuasively) that Microsoft, for instance, would benefit from piracy in China. (“Over time, as the nation grows more wealthy . . . people will buy software rather than steal it.” Whereas if Chinese used only free GNU/Linux now then, they would not be

imposes the additional requirement that the products be traded (to assess value); antirivalness, however, has no such additional requirement. Avoiding this condition is important because components of Internet Projects (e.g., Wikipedia) often do not involve any trading. This antirivalness approach has one more advantage—it averts the problem of proving altruistic motivation, which impedes the other theories that will be discussed in detail below.

However, Ghosh's and Weber's theories suffer from a common defect. While arguing for the uniqueness of the Internet, the antirivalness and cooking-pot theories fail to explain the co-existence of two opposite phenomena—programmers sometimes opt for property regimes and, at the same time, also provide code for “free.”⁷⁶ In other words, the uniqueness of the Internet argument requires us to believe the following contradiction. People will produce creative work in the brick-and-mortar world in order to gain property title, yet the Internet is so unique that the same people will not desire property rights for identical work on the Internet.⁷⁷

A second problem with the Internet Theories advanced so far is they are too narrow and limited in scope. Internet Theories are unable to scale up and explain other online collaborations, as shall be demonstrated below. One group of labor theorists argues traditional labor incentives motivate Internet Projects. Josh Lerner and Jean Tirole, for instance, exemplify the labor approach and (on the basis of observations of Apache HTTP⁷⁸ and open source email programs⁷⁹) argue software

buying Microsoft products even in future, resulting in net loss for Microsoft.). See LESSIG, *FREE CULTURE*, *supra* note 1, at 49.

⁷⁶ WEBER, *OPEN SOURCE*, *supra* note 3.

⁷⁷ See *infra* Part II.B.2 for a fuller treatment of this fatal objection that advocates of stronger copyright put forth.

⁷⁸ The Apache HTTP Server is open source software, developed and maintained by an open community of developers and was the first viable alternative to the Netscape Communications Corporation web server (currently known as Oracle iPlanet Web Server). Apache not only played a key role in the initial growth of the World Wide Web, but is also the most popular HTTP server software in use. Apache is estimated to serve 63 percent of all websites, 66 percent of the million busiest as per May 2011 estimates. In 2009, it became the first web server software to surpass the 100 million website milestone. *Apache HTTP Server*, WIKIPEDIA, http://en.wikipedia.org/wiki/Apache_HTTP_Server (last visited June 17, 2011). See also WEBER, *OPEN SOURCE*, *supra* note 3, at 6 (describing open source projects. There were thousands ranging from small utilities to office suites, and operating systems of which Linux and Apache are most well known. “Apache simply dominates the web server market—over 65 percent of all active web sites use Apache. Nearly 40 percent of large American companies use Linux in some form; Linux is the operating system for more than a third of

programmers participate in Internet Projects because of traditional labor benefits (such as immediate benefits, delayed rewards, career concerns, and ego gratification), rather than altruism.⁸⁰ Another group, specifically “migration theorists” (e.g., David Lancashire), argues developers embraced Open Software in order to shift to a higher wage level and “tap lucrative contracts abroad.”⁸¹ Thus, both groups of labor theorists select one project (from a host of non-commercial Internet Projects) to put forth a theory. Both of these theories explain one activity but fail to explain other online collaborations, such as Wikipedia or Project Gutenberg, which do not provide these labor benefits.⁸²

active web servers and holds almost 14 percent of the large server market overall.” (citation omitted)).

⁷⁹ Perlmail, Sendmail, and others are open source email transfer and management programs, and Sendmail powers about 80 percent of the world’s mail servers. *See also* WEBER, OPEN SOURCE, *supra* note 3 (for some examples of how we all use and are the recipients of open source—a Google search uses Linux and Yahoo! Directory service is on FreeBSD, another open source initiative. Similarly, Linux was used to develop the special effects for Titanic, Lord of the Rings, and other films.).

⁸⁰ Josh Lerner & Jean Tirole, *Some Simple Economics of Open Source*, 50 J. INDUS. ECON. 197, 200, 212–13 (2002) (arguing that, on the basis of Apache, Perl, and Sendmail, traditional labor incentives motivate Internet Projects. Lerner & Tirole argue that a combination of immediate benefits, delayed rewards through career concern (including future jobs, share in commercial open source based companies, future access to venture capital markets), and ego gratification incentives (including peer recognition) rather than altruism is the reason open source has succeeded.).

⁸¹ David Lancashire, *Code, Culture and Cash: The Fading Altruism of Open Source Development*, FIRST MONDAY (Dec. 3, 2001), <http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/904>. David Lancashire, on the basis of Open Software, argues for the Mayflower (or historical migration) effect of labor rather than for altruism. Lancashire contends, “[i]n a global economy lacking perfect labor mobility and characterized by wage-inequality across countries, we expect individuals to produce free software *if* doing so can shift them to a higher wage-level. This ‘fixed cost analysis’ implies (as Lerner & Tirole suggest in their paper) that developers may embrace Open Source work as a way to tap lucrative corporate networks abroad.” *Id.*

⁸² *See, e.g.*, Lerner & Tirole, *supra* note 80. But neither career concern nor ego gratification can explain Wikipedia or Project Gutenberg, which are hugely successful collaborative projects. Further, Lerner & Tirole argue (a) the Internet is not distinctive but merely changes the scale of production and expands formalization, and rely on (b) “the long tradition of sharing and cooperation in software development.” *Id.* By pointing to the large number of proprietary software, advocates of stronger copyright can easily disprove this contention that Lerner & Tirole raise. Lancashire’s migration labor theory also fails to explain Wikipedia, Project Gutenberg, and other Internet Projects, which do not

A second subset of Internet Scholars argues that hacker ethics or altruism motivates the online projects (Hacker Ethicists). Hacker Ethicists argue these altruistic motivations have expanded beyond software and into other activities on the Internet. By arguing for altruism, this group boxes itself into a tight corner. Hacker Ethicists assume the burden of proving: (a) programmers and other Internet Project participants are devoid of non-altruistic motivations, and (b) the conditions that are necessary for altruistic projects to take root exist.⁸³ Hacker Ethicists run the risk of espousing too narrow a theory and fall into the “cult” trap to which advocates of stronger copyright have already alluded.

A third group, “commons theorists,” argues from the perspective of the larger movement toward the public domain or digital commons.⁸⁴ According to the commons theorists, open source is just one instance of this larger movement. The commons theorists have a key advantage—they do not have to establish motivations unique to hackers, a requirement that trips up other theorists such as the Hacker Ethicists discussed earlier. The commons theorists instead call for an expansive study that includes collaborations from the brick-and-mortar world.

provide any networking or allied career benefits for collaborators. See Lancashire, *supra* note 81.

⁸³ See, e.g., Eric Raymond, *The Cathedral and the Bazaar: Musings on Linux and Open Source by an Accidental Revolutionary* 65–113 (2001), available at <http://catb.org/~esr/writings/homesteading/cathedral-bazaar/>. Eric Raymond explains hacker culture as a sociological phenomenon. This geographical-sociological approach however fails to explain the co-existence of software prompted by both motivations: open software and software protected by IP rights or proprietary software. Raymond argues that hacker culture has developed into a specific type of gift-culture involving history and values. He allows for multiple varieties of hacker ideology leading up to a puritan practice, and explains the significance of peer repute (prestige) in every gift culture and idealized the sublimation of ego. This theory however fails to explain why this sublimation occurs only amongst hackers. Why did this Europa-American attitude to the sublimation of the ego not prevail in other industries and only emerges in Open Software? He could argue the peculiarity of the open-source culture, and the complexity of artifacts produced means the value of these artifacts is not as obvious as in an exchange economy. Even, *if arguendo*, we accept that skilled professionals are unable to assess the potential value of their contribution, alternative measurements like opportunity cost negate this already thin “inability to assess” argument. In other words, the objection remains—this theory cannot explain why do people collaborate on open software but not in any other industry.

⁸⁴ Boyle, *supra* note 58, at 246; Eben Moglen, *Anarchism Triumphant: Free Software and the Death of Copyright*, FIRST MONDAY (Aug. 2, 1999), <http://www.blagblagblag.org/anarchism/index.html>.

Once the commons theorists argue for a more expansive study, next, they determine the conditions necessary for collaborative production (on the basis of the aforementioned broader study of collaborative behavior). The commons theorists argue for the co-existence of both spheres—collaborative and commercial activity in the digital world—rather than arguing that peer-based mechanisms will replace the market. Even though the commons theorists successfully avoid the barriers confronted by others, their theory is inadequate. In refraining from constructing a positive theory or explanation, this group fails to fulfill the main purpose of studying such collaborative projects: to provide a coherent theory to limit copyright’s expanding empire. In other words, the commons theory fails to provide any justification or basis to limit further expansions in copyright.

For instance, Yochai Benkler, who endorses the commons approach, expands the study beyond open software to include other collaborative activities on the Internet (such as book digitization projects and Internet encyclopedias).⁸⁵ This expansive study is a useful first step but stops short of providing a bright-line rule to identify when collaboration is a better incentive than property rights.⁸⁶ In other words, Benkler’s argument falters at the step of providing the law with a positive covenant or the guidance to determine when copyright ought to be reined in to enable commons-based information production.⁸⁷

⁸⁵ Yochai Benkler, *Coase’s Penguin, or, Linux and The Nature of the Firm*, 112 YALE L.J. 369 (2002) [hereinafter Benkler, *Coase’s Penguin*]. Benkler expanded the study to include other collaborative activities on the Internet, including book digitization projects, Internet encyclopedias, relevance and accreditation for search engines, etc. See *id.* at 384, 392, 398. For Benkler’s arguments on parallels in the brick-and-mortar world, such as car-pooling and others, see Yochai Benkler, *Sharing Nicely: On Shareable Goods and the Emergence of Sharing as a Modality of Economic Production*, 114 YALE L.J. 273, 281 (2004). For a discussion on Open Software, see Boyle, *supra* note 58, at 371 (“The emergence of free software and the phenomenal success of its flagships—the GNU/Linux operating system, the Apache web server, Perl, Sendmail, BIND and many other projects—should force us to take a second look at the ‘dominant paradigm’ of markets.”).

⁸⁶ Because Benkler’s study includes multiple projects, it has the advantage of scaling from free software to a general principle. Benkler argues peer-based production corrects the inefficiencies in private property motivations and strong IP rights would raise the cost of access. Benkler, *Coase’s Penguin*, *supra* note 85, at 445. Benkler also recognized the significance of peer-based production models, and additionally, the features of modularity and granularity that were common to various collaborative efforts on the Internet. *Id.* at 380, 433.

⁸⁷ Benkler’s argument can, at the most, be interpreted as providing a negative covenant. *Id.* at 446 (“That we cannot fully understand a phenomenon does not

Similarly, another commons theorist, James Boyle, draws parallels with trends toward commons in science, law, and other arenas.⁸⁸ Boyle's theory also fails to provide a reasoned justification to limit property expansion on the Internet. Like Benkler, Boyle identifies modes of nonproprietary intellectual production that flourish alongside the proprietary regime.⁸⁹ John Clippinger and David Bollier also point to the trends toward donation to the public domain in evolutionary science and other fields.⁹⁰ But Boyle, as well as Clippinger and Bollier, fails to indicate when lawmakers and government regulators ought to refrain from expanding property rights.

Another potential argument stems from the context of the Internet and free speech, though it may not have been articulated as yet in the context of software. First Amendment scholar Jack Balkin argues that explaining the limited role of property rights in the Internet age requires only an understanding of the salience of Internet technologies and their impact on innovation rather than on *novelty*.⁹¹ Jack Balkin

mean that it does not exist.”). I agree with Benkler and others that a more detailed study of peer production is required. But the problem is that expansion critics rely upon Internet Projects to limit property law expansions, and yet they have not been able to identify when collaboration is a better incentive than property rights. This theory thus remains incomplete and does not provide for a justification to limit copyright expansions.

⁸⁸ Boyle relies upon the characteristics that Benkler identified—namely, modularity and granularity. On that basis, Boyle draws parallels with similar activity in the spheres of science, law, education, and music. Boyle, *supra* note 58, at 235, 245; *see also* Benkler, *Coase's Penguin*, *supra* note 85.

⁸⁹ Boyle's response to the issue (whether the limited example of the open software movement allows for generalization) relied entirely upon the hunch that the increasing migration of the sciences toward data-rich, processing-rich models of distributed, nonproprietary intellectual production will likely increase innovation and discovery. Boyle, *supra* note 58, at 246. Also, Boyle argued for a scaled-down though still strong IP regime. *Id.* at 247.

⁹⁰ John Clippinger & David Bollier, *A Renaissance of the Commons: How the New Sciences and Internet are Framing a New Global Identity and Order*, in CODE: COLLABORATIVE OWNERSHIP AND THE DIGITAL ECONOMY 259, 275 (Rishab Aiyer Ghosh ed., 2005) (arguing for the Internet as one of several examples of an emerging commons or the limits of free-market dogma, albeit with different visibility for its social, economic, and political repercussions). Note Josh Lerner & Jean Tirole also study commons examples. For instance, they focus upon “user driven innovation” in other areas of technological innovation like the machine tool and scientific instrument industries, though they do agree that the Open Source model is distinct from these in its promise of recognition and reward. *See* Lerner & Tirole, *supra* note 80.

⁹¹ In the context of the Internet and its impact on freedom, Jack Balkin rightly argued the question is not whether the Internet does something new, but whether

raised this argument in the context of free speech but it arguably can be extended to Internet Projects. However, even this argument would not create a coherent or persuasive case for Internet Projects to limit copyright. This salience-not-novelty argument may be logically correct, but fails to provide any bright-line prescription. Moreover, the salience-not-novelty argument puts us back at square one, and the question that was put to Lessig in *Eldred*.⁹² In other words, courts still require clear evidence in order to limit copyright and a three-century-old presumption.

In sum, no Internet Theory so far is able to provide a coherent explanation for the various creative endeavors ostensibly flourishing on the Internet without IP protection. Hence, gaps persist in existing literature.

2. Copyright's Weapon – The Property Intuition

In addition to the intrinsic gaps in the Internet Theories upon which Part I.B.1 elaborated, advocates of stronger copyright point out two critical flaws in Internet Theories. First, advocates of stronger copyright argue the opposing theories fail to overcome the barrier presented by the intuition that property rights incentivize production. In other words, the current theories calling for weaker copyright fail to provide a coherent explanation for the co-existence of two opposite motivations: the willingness to engage in expression on the Internet without property rights, and parties seeking financial remuneration at other times and in other spaces for identical activity. Glass aptly elucidates this intuition (and the damaging lack of coherence in any Internet Theory so far):

Most programmers have always liked money. It's no accident that salaries are sky-high, that stock options are an ever-present force, . . . that some of the world's wealthiest people are in software. The connection between being good at software work and being rich is no accident; most software people seek the money that comes with the work. Contrast that with the fact that the open-source movement is about making unpaid contributions to software products. . . . As if the best, brightest, and most talented software people had no desire to work in the traditional, play-for-pay entrepreneurial software environment. As a member of the loyal opposition, I don't buy that.

it makes certain aspects of social world particularly salient. This argument on digital salience in the context of human freedoms would just as easily be applicable to innovation. *See* Balkin, *supra* note 4, at 2–3 (“What features of the human activity of the human condition does a technological change foreground, emphasize or problematize? And what are the consequences for human freedom of making this aspect more pervasive, central and important than it was before?”).

⁹² LESSIG, FREE CULTURE, *supra* note 1, at 128.

I cannot imagine that the software field will experience a groundswell change toward the maintenance, reading, and study of software for no financial reward, away from the traditional importance placed on development and money. . . . Any change that does happen will be limited to one or a few cults emerging from a niche culture of the software field. In other words, *an interesting chapter in software's history, but hardly a ground-rules-changing one.*⁹³

Scholars also claim that Internet studies cannot be relied on as evidence of “IP *without* IP.”⁹⁴ Professor Ronald Mann, for instance, argues open source depends upon, and is consistent with, proprietary software (Dependence Objection).⁹⁵ Rochelle Dreyfuss adds to Mann’s empirical evidence and raises an objection that is fatal for Internet Theories so far: the vast majority of non-IP projects are “based on a strong norm of attribution,” and therefore rely on pre-existing IP regimes.⁹⁶ Indeed, open source and other projects depend upon financial and other forms of support from proprietary software firms.⁹⁷ Moreover, advocates of stronger copyright argue that the Internet Scholars’ criteria for successful Internet Projects exposes the narrow confines and limits non-property-based projects to only a few situations,⁹⁸ which may also be

⁹³ See Glass, *supra* note 15 (emphasis added); see also THOMAS L. FRIEDMAN, THE WORLD IS FLAT 101 (2005) (“Added Bill Gates, ‘You need capitalism [to drive innovation.] To have [a movement] that says innovation does not deserve an economic reward is contrary to where the world is going.’”).

⁹⁴ Dreyfuss, *supra* note 11 (emphasis added).

⁹⁵ Mann, *Commercializing Open Source Software*, *supra* note 16, at 46.

⁹⁶ Dreyfuss, *supra* note 11, at 1449 (arguing that the vast majority of software programmers working on open source are motivated by extrinsic motivations or labor market benefits whereby programmers participate in open source projects to signal competence and improve employment prospects). Dreyfuss also argues that open platforms are often enabled by direct financial support from proprietary firms because programmers are paid salaries, which permits them to write code for open source projects that consequently enables maintenance services from open source services like Red Hat and others. *Id.* at 1451–52.

⁹⁷ *Id.* at 1450 (“But since the segment of the market that pays for programmers is largely supported by intellectual property rights, there is reason to question whether, in the absence of an intellectual property regime, there would be such strong interest in participating in open source.”).

⁹⁸ For instance, Dreyfuss utilizes Benkler’s study on the features of peer production projects (modular, granular, and large number of contributors) and argues “many innovation opportunities are not susceptible to this type of division or integration.” *Id.* at 1453. Dreyfuss also points out that while this may be possible in software, science does not lend itself to granular modules or continuous forward movements. *Id.* at 1452–54. Dreyfuss, for instance, points out that Benkler and the other scholars studying open source ignore the high

unstable over time.⁹⁹ Ironically, Internet Scholars’ studies are used to strengthen Glass’s “cult” objection.

Dreyfuss’s real and effective objection echoes Justice Kennedy’s question in *Eldred*: *where is the empirical data that proves information production will continue unabated even without intellectual property laws?*¹⁰⁰ Absent this evidence, it is difficult to argue for scaling back pre-existing IP laws.

Advocates of stronger copyright thus effectively reply to Internet Scholars. Advocates of stronger copyright build upon the dominant property intuition to argue that Internet Projects are dependent on pre-existing IP protections and, as a result, cannot be utilized as evidence of “IP without IP.”¹⁰¹ Thus, in spite of the recent studies pertaining to open software and other Internet Projects, the evidence judges seek in order to limit copyright continues to elude them.

3. Gap in the Property Intuition

Internet Theories put forth so far are unable to effectively address the property intuition because they have confused commerce with property. Copyright scholars inquire, “*Why would software programmers work for monetary incentives but put up code for free?*” This question commences the quest to establish software programmers’ motivations. This quest to prove altruistic motivation is a logical misstep because advocates of stronger copyright incorrectly assume “incentive” is synonymous with “property.”

initial costs of developing strong leaders, intellectual capital, and skills. *Id.* at 1454. This harks back to Dreyfuss’s and Mann’s argument that open source counts on commercial software firms to pay for these high initial costs.

⁹⁹ Dreyfuss points out that there may also be a “natural ending point” to open projects once the technology develops sufficiently. *Id.* at 1456. In other words, there is greater sharing when the technology’s future is uncertain as a risk mitigation mechanism, but “as the field clarifies and commercial applications become better understood, the need to spread risks declines. . . . Collective development may come to a halt as the parties involved rely increasingly on secrecy and intellectual property rights.” *Id.*

¹⁰⁰ For the Dependence Objection, see Dreyfuss, *supra* note 11. In addition to objecting to open source studies as evidence of “IP without IP,” Dreyfuss also leveled a clear objection to the previous industry-based studies. Dreyfuss pointed out that the fashion industry-based studies omitted trademarks, which is the key IP for the fashion industry. Therefore, Dreyfuss argued, given this critical gap in the fashion industry studies, they were inadequate to conclude IP is irrelevant to industry. This is the proverbial last nail in the coffin with regard to the fashion industry-based studies. *See id.* at 1452.

¹⁰¹ *Id.*

Simply stated, money and property are two different factors, even if they are sometimes related, and separating the two factors corrects this logical misstep.¹⁰² In the software context, monetary incentives, or “cash-for-code,” does not automatically necessitate property rights. This distinction between property and monetary incentives relieves us of any need to inquire into the moral motivations of software engineers. Suffice it to say that they write code (or other creative work) without property rights as the primary goal.

This logical distinction may be relevant, but is not useful because judges still require evidence of “IP without IP” in order to limit copyright expansions. For instance, this logical distinction echoes Lessig’s “correct but not the right” response to Justice Kennedy in *Eldred*.¹⁰³ In this case, during oral hearings prior to writing the majority opinion, Justice Kennedy had asked for evidence of “IP without IP.” Lessig responded “like a professor correcting a student,” stating the issue at stake was a structural claim (on the limit on extensions to the copyright term) rather than an empirical one.¹⁰⁴ Thus, judges were

¹⁰² Although the concepts of property and money overlap, they have different characteristics. For example, property and money are both fungible, but property also has the characteristic of exclusion. This argument is in line with classical economic theory as propounded by Adam Smith, David Ricardo, and James Mill. These classical economists argued that “money is a veil” and the fundamental focus remains on the “‘real’ exchange of goods and services as opposed to the accumulation of financial resources.” John Smithin, *Introduction to WHAT IS MONEY?* 1 (John Smithin ed., Routledge 2000). For a classic legal exposition that is consistent with the distinction drawn in this Article, and how money, IP, and funds differ from property, see J.E. PENNER, *THE IDEA OF PROPERTY IN LAW* 109–111 (Clarendon Press 1997). Penner, for instance, points out money is a “different kind of property” as it is used as “currency” or “negotiable chattel.” In other words, when one receives money, one is entitled to the value of the currency and not legal title to the specific coins. *Id.* at 109 (citations omitted). See J.W. HARRIS, *PROPERTY AND JUSTICE* 47–50 (Clarendon Press 1996) (exposing the distinctions and overlaps in the concepts of money and property). Harris (relying on F.A. Mann) points out that on the one hand, money is a chattel that is meant to serve as “universal means of exchange.” *Id.* at 48. On the other hand, similar to property (and unlike chattels), money provides the power to allocate scarce resources. “Sometimes, money is conceived of as property as well as wealth, and sometimes as a form of wealth other than property. As we shall see, some political philosophers have hiccupped over just this ambiguity.” *Id.* at 49. See also Thomas Merrill, *Property and the Right to Exclude*, 77 NEB. L. REV. 730 (1998) (discussing the right to exclude as the “sine qua non” characteristic of property, rather than just one of the most important characteristics of property).

¹⁰³ LESSIG, *FREE CULTURE*, *supra* note 1.

¹⁰⁴ *Id.*

seeking evidence of “IP without IP,” and the inability to provide this material was the turning point in the decision to uphold the statute extending the term of copyright. This search for “IP without IP” leads us directly to the discussion in Part II: the evidence of a commercial software industry flourishing in India without strong IP protections.

However, this logical gap is briefly discussed here for three reasons. First, it situates and demonstrates why the Indian evidence is even more on-point. Commercial profit is sufficient incentive for the software industry in India, and therefore, the software firms do not seek property rights. Comparing property to commercial incentives (as with the Internet Theories mentioned earlier) presents a problem of comparing apples to oranges. The commercial software industry data from India, however, enables scholars to focus on the correct question: *Are copyright and patent protections necessary for software programmers to write programs?* On that note, a second related question arises: *Would innovation and the software industry not exist if not for copyright or patent protection?*

Mann, at the very start of his seminal study, stated that, absent objective evidence quantifying “the benefits that the commercial software industry derives from IP,” it is difficult to analyze the problem of what role property rights play in open source.¹⁰⁵ By providing evidence of “IP without IP” from the commercial software industry in India, this Article fills the precise gap in the literature Mann identifies. Moreover, the evidence from the commercial industry has one more advantage: it remains untouched by the Dependence Objection that is fatal to earlier Internet Theories, as Mann and Dreyfuss demonstrated to great effect.¹⁰⁶

¹⁰⁵ Mann, *Commercializing Open Source Software*, *supra* note 16, at 2.

¹⁰⁶ See Dreyfuss, *supra* note 11, at 1439 (arguing that “[t]he time is thus ripe to consider whether and when intellectual property rights are needed”). Hence, the Indian evidence is timely, sufficient, and not subject to the various objections from the open source movement. For details, see *supra* Part I.B.2. The main objection is that open source and other endeavors are based on attribution, which is effectively predicated on pre-existing IP regimes. The natural experiment in India does not run afoul of these objections: (a) the Indian software industry does not depend on attribution either directly or indirectly because works for hire belong to Indian employers; (b) there is no evidence that U.S. clients provide any additional payment to Indian firms in exchange for IP rights in software—that is, contracts are essentially to execute and perform projects, and provide deliverables; (c) the evidence from India does not require proving that the Internet has unique characteristics that render property rights as disincentive, nor that software programmers are more motivated by altruism. Further, the Indian software industry is well-developed. Hence, the objections posed by

II. “IP WITHOUT IP”: THE SOFTWARE INDUSTRY IN INDIA

*“[I]t took us 23 years to reach the first billion dollars in revenues while we reached the next billion in 23 months,” as famously remarked by Nandan Nilekeni one of the founders of Infosys Ltd., and now a Cabinet Minister in India.*¹⁰⁷

The software industry in India provides evidence that commercial industry is unaffected by an increase or decrease in IP protection. The Indian industry has emerged as the fastest growing software industry in the world in the period between 1994 and 2010. In the same period, the government introduced copyright and patent protections for software, providing a natural experiment and an opportunity to double-check or verify the proposition.¹⁰⁸

Part II.A.1 will provide data on whether a surge in the Indian industry’s growth rate occurred when copyright or patent protection was introduced. Parts II.A.2–4 will provide a brief background discussion of the industry relevant to the analysis. It will describe how the software industry is viewed as an important contributor to the national economy, as well as India’s economic rise at the global level. As a result of the industry’s national importance, the software industry is well regarded and has an established industry lobby. IP royalties, however, constitute a very small portion of the revenues that software firms earn. Part II.B discusses some anticipated objections to the Indian data. Part II.C analyzes the copyright and patent laws covering software to demonstrate that IP protection is relatively weak in India. This observation, when combined with the previous growth data, suggests the industry may benefit from mild laws. Although this Article focuses on copyright laws, Part II.C.2 shall analyze the extent of patent coverage for software so that we can eliminate patents as an alternate causal story. Furthermore, because the legislature withdrew patent protection, this Part will double-check whether the industry growth rate would *fall* if IP protection

Dreyfuss that non-IP models may be limited to early development stages and are unstable in time can be eliminated. In other words, these factors may disappear once the nascent industry further develops. India is aptly suited to provide the needed evidence because it is a net exporter of software. Dreyfuss cautions that sometimes IP laws may be increased by legislators in net-exporting countries, like the U.S., to earn more from exports. Dreyfuss, *supra* note 11, at 1465. The evidence from a net-exporting industry like India demonstrates that the industry does not require such a tilt even for an export support standpoint.

¹⁰⁷ *Infosys Revenue Tops \$2B; Q4 Net Rises 20.6 Pct*, HINDU BUS. LINE (Apr. 15, 2006), <http://www.thehindubusinessline.in/2006/04/15/stories/2006041504050100.htm>.

¹⁰⁸ See Huang, *supra* note 21.

diminishes.¹⁰⁹ It should be noted that neither individual firms nor the industry at large protested the withdrawal of patent protection.

A. Growth Without Copyright Surge – An Overview

1. *Growth Not in Step with Intellectual Property*

If the traditional law and economics prescription were correct, then the two periods during which IP protection increased would have witnessed a surge in growth. Instead, the actual growth curve (Figure 1 below) demonstrates no such surge after the legislature introduced copyright and patent protections. The growth rate should have risen sharply when copyright protection for software came into effect in May 1995. In other words, the growth slope should have been steeper, matching the counterfactual scenarios depicted in Figure 1.

Similarly, if the property-growth paradigm is true, the growth curve should display an inverted V in the period between 2004 and 2005. This inverted V would have illustrated (a) a surge in growth between December 2004 and April 2005 when patent protection was provided for software, followed by (b) an immediate, sharp decline when the legislature rejected the amendment and withdrew patent protection. The slope of the industry growth curve has however been unaffected by the introduction of copyright and patent protections. Ironically, periods of marked industry growth did not occur when IP protection was strongest but occurred *after* IP protection was reduced.¹¹⁰ For instance, the periods immediately after the repeal of patent protection in April 2005 and onward (in fiscal years 2005 and 2006) saw a sharp increase in industry growth. Sifting through this data to determine the positive causal conditions and why the industry took root in India is left for future work. For gathering evidence of “IP without IP,” the central purpose of this Article, it is sufficient that an increase or decrease in IP protection appears to have no bearing on the growth curve.

The immediate lack of surge may be explained by the fact that insufficient time elapsed after the legal measure was introduced and before the effect might be visible. However, given the marked industry indifference (as will be detailed in Part II.C.2), it is difficult to believe that an insufficient time lapse is the sole reason for the lack of a surge in growth. Even if, *arguendo*, we accept the lack of surge in response to the introduction of the patent law was because of inadequate time lapse, this condition does not explain the lack of surge *after* copyright protection was introduced. The Copyright Act was passed in April 1994 and came into effect in 1995; industry knew at least a year in advance that software

¹⁰⁹ *Id.*

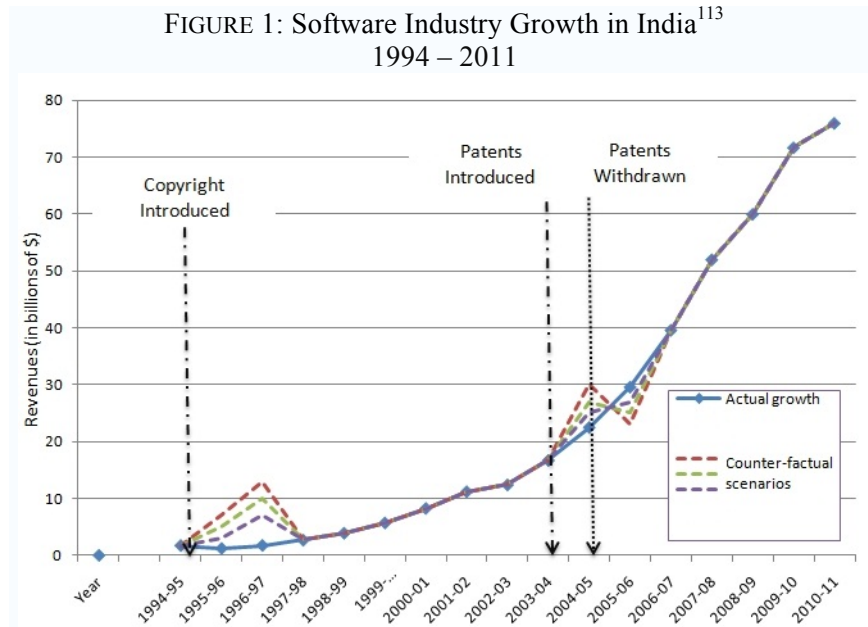
¹¹⁰ *See infra* Figure 1.

would definitely be protected under the Copyright Act. Conceivably, this knowledge enabled firms to start seeking royalties, pursue copyright protection, and display changes in behavior and strategy, if copyright was indeed an incentive.

A second and related objection could be that *more time must elapse after* the copyright amendment to detect and measure the effect (of the amendment).¹¹¹ We can disprove this claim easily by analyzing the software firms' behavior. If the only reason we do not see a surge is because of inadequate time, one can reasonably expect there would have been a significant change in revenues from IP royalties or a firm's conduct a few years *after* the amendment. The data, however, disputes this conclusion. The head of a top-five software firm confirms that, more than *15 years after* copyright was introduced for software, there currently is no visible change in the industry or software firms' behavior.¹¹² In other words, there was no significant change in (a) the revenues a firm earned from IP royalties, (b) firms' business or contracts with clients (in order to now press copyright claims), or (c) copyright infringement claims (or patent filings) in India or abroad. The firms' behavior and indifference for close to *15 years after the copyright amendment* helps eliminate the "insufficient time-lapse" objection. The lack of surge cannot be explained merely as a timing issue, and so, we can reasonably eliminate this set of objections to the natural experiment data.

¹¹¹ I thank Scott Hemphill and the editors of this Journal for pointing out this possibility.

¹¹² Interview with member of senior management of a top-five software firm in India, in N.Y., N.Y. (Feb. 16, 2011) [hereinafter Interview with Management]. Note that the senior management officer preferred to be anonymous as some of the information shared is confidential financial data related to the business of the firm.



¹¹³ The data relied upon to plot industry growth are from NASSCOM studies. As the top software industry body in India, NASSCOM is the best source of data. Due to variation in defining software and information technology, studies have produced different estimates of industry growth. Utilizing NASSCOM studies provides the advantage of consistency and uniform standards. Other studies would require using a patchwork of multiple sources to cover the requisite years, thereby increasing errors (stemming from calculations based on different definitions of software and IT). Note that I use NASSCOM’s total industry revenues (software and hardware) to prevent statistical and methodological errors stemming from changing definitions or notions of what constitutes services, software, etc. in the industry. This also does not detract from the analysis in this Article as software constitutes a vast majority of the annual revenues. To verify the analysis and for a detailed breakdown, see the sources listed below. The sources of each year’s estimates obtained and plotted in Figure 1 are as follows.

- a. 1994–95 – *Indian IT Industry – A Success Story*, NASSCOM, <http://www.nasscom.in/download/IndianITIndustry.doc> (last visited June 2, 2011).
- b. 1995–96 – INDIAN EMBASSY, http://www.indianembassy.org/indianinfo/india_it.htm (last visited June 2, 2011) (quoting NASSCOM).
- c. 1996–2001 – Indian Software Export grows by 65% in 2000–01, NASSCOM, <http://www.nasscom.in/Nasscom/templates/NormalPage.aspx?id=2640> (last updated July 12, 2006).
- d. 2001–02 – Indian Software and Services Exports, NASSCOM, <http://www.nasscom.in/Nasscom/templates/NormalPage.aspx?id=2635> (last updated July 12, 2006).

The Indian data shows growth is unrelated to an increase (or a decrease) in IP protection. The following subsection will elaborate on the industry's continued display of robust growth and its rising contribution to the economy.

2. Growth Story – Extent and Depth

The software industry in India substantially contributed to the national economy and India's economic ascendance at the international level. By 2010, software had grown into a \$76 billion industry in India, and Indian firms have emerged as strong players in the international market.¹¹⁴ Indian software firms account for \$71.7 billion, or nearly fifty percent, of the \$1.6 trillion worldwide industry.¹¹⁵ Nor is the growth likely to stop soon—India's top two software firms (Tata Consultancy Services Ltd. and Infosys Technologies Ltd.) grew 20 percent in 2010,

e. 2002–03, 2003–04, 2004–05 – Indian software and services exports exceed expectations, NASSCOM (June 2, 2005), <http://www.nasscom.in/Nasscom/templates/NormalPage.aspx?id=2638>. Note that latest 2002–03 estimates were taken from this recent statement rather than from the older 2002–03 initial estimates provided in the earlier 2001–02 page. This choice does not impact the argument made in this Article, and later estimates were used for better accuracy.

f. 2005–06 – *Indian IT Software And Services Grow By 31.4% in FY 05–06*, NASSCOM, <http://www.nasscom.in/Nasscom/templates/NormalPage.aspx?id=28833> (last updated Oct. 17, 2006).

g. 2006–07 – *Indian IT Software and Services Revenues*, NASSCOM, <http://www.nasscom.in/Nasscom/templates/NormalPage.aspx?id=51734> (last updated July 3, 2007).

h. 2007–08 – *Nasscom Releases FY08 Revenue Performance and FY09 Forecast*, NASSCOM, <http://nasscom.in/Nasscom/templates/NormalPage.aspx?id=54255> (last updated July 15, 2008).

i. 2008–09 – *Nasscom Releases Indian IT Software and Services – FY09 Performance and Future Trends*, NASSCOM, <http://www.nasscom.in/Nasscom/templates/NormalPage.aspx?id=55739> (last updated Feb. 4, 2009).

j. 2009–10 – *Indian IT – BPO Industry Exports Touches USD 50 Billion Landmark*, NASSCOM, <http://www.nasscom.in/Nasscom/templates/NormalPage.aspx?id=58639> (last updated Feb. 4, 2010).

¹¹⁴ Note this study's estimate has combined the software, hardware, and business process outsourcing industry, and the latter's inclusion in no way detracts from the robustness of the analysis in this article. See NASSCOM, *THE IT BPO SECTOR IN INDIA: STRATEGIC REVIEW – 2011*, http://www.nasscom.in/sites/default/files/researchreports/ExecSummary_0.pdf [hereinafter *IT BPO SECTOR IN INDIA*] (indicating the industry has grown in the last two decades from a base of \$150 million in 1991–92).

¹¹⁵ See NASSCOM, *INDIAN IT-BPO INDUSTRY 2009*, available at <http://www.scribd.com/doc/54953143/IT-Industry-Factsheet-Mar-2009> (last updated Feb. 2009).

while other firms in the global top 10 grew only at a rate of 5.8 percent.¹¹⁶

With a compound annual growth rate exceeding 50 percent, the software industry has been the fastest growing sector in India for over a decade and contributes to a significant portion of the national GDP.¹¹⁷ The software industry contributes handsomely to the national foreign exchange earnings too—an estimated \$47 billion in 2009—which is unlikely to decline in the near future.¹¹⁸

Public perception also favors the industry because it is commonly recognized that the software industry greatly propelled the Indian economy. The public also credits the software industry for transforming India’s image at the global level. As discussed earlier, India has emerged as one of the fastest growing economies worldwide, posting a healthy growth rate of 8.4 percent in 2005–2006. It actually surpassed China’s growth rate by 0.1 percent in 2010, according to the IMF’s World Economic Outlook.¹¹⁹

¹¹⁶ Sridhar K. Chari, *Indian IT firms Outpace Global Rivals in Growth*, LIVESMINT (May 13, 2011, 1:00 AM), <http://www.livemint.com/2011/05/12204421/Indian-IT-firms-outpace-global.html?type=tp> (quoting Gartner Inc.’s figures).

¹¹⁷ DUN & BRADSTREET REPORT, *supra* note 24. For instance, the software industry contributed over 6.1 percent of the GDP in 2010.

¹¹⁸ In fifteen years, software exports have increased substantially—from \$734 million in 1995–96, to \$4 billion in 1999–2000, to \$47 billion in 2009. See *IT Industry Factsheet*, NASSCOM, <http://www.scribd.com/doc/54953143/IT-Industry-Factsheet-Mar-2009> (last visited Dec. 18, 2011). India is set to be the leading software exporter in FY12, increasing its IT export revenues to \$68–70 billion (an increase of 16–18 percent from FY11). *India’s Software Exports Seen up 16–18pct in FY12*, REUTERS (Feb. 10, 2011, 7:31 AM), <http://www.reuters.com/article/2011/02/02/india-outsourcing-outlook-idUSSGE71106L20110202> (quoting NASSCOM’s revenue forecast); *India’s Software Exports Seen Up 16–18% in FY12*, DAILY FT (Feb. 7, 2011, 2:36 AM), <http://www.ft.lk/2011/02/07/india-s-software-exports-seen-up-16-18-in-fy12/> (quoting the same revenue forecast from NASSCOM). See generally Jason Dedrick & Kenneth L. Kraemer, *Information Technology in India: The Quest for Self Reliance*, 33 ASIAN SURV. 463 (1993). Incidentally, the Indian experience also addresses Dreyfuss’s concern that policy reasons may motivate net exporter countries to increase IP products and exports to improve their balance of payment. See Dreyfuss, *supra* note 11.

¹¹⁹ See sources cited *supra* note 25.

3. Industry Influence – Extent and Depth

The software industry has an effective and strong lobby at the individual firm level and through its industry lobbying group, the National Association of Software and Service Companies (NASSCOM).¹²⁰ Through statements to the press, Indian software firms express displeasure when India, the United States, or any other country promulgates laws and regulations that adversely impact them.¹²¹ For instance, Indian entrepreneurs based in Silicon Valley interact with governments to influence policies.¹²² However, the software firms are silent with regard to IP protection in particular and do not endorse its increase.¹²³

¹²⁰ NASSCOM is the top industry body representing the Indian software firms. 95% of the Indian software firms are members. *About NASSCOM*, NASSCOM, <http://www.nasscom.in/Nasscom/templates/NormalPage.aspx?id=5365>.

¹²¹ *E.g.*, NASSCOM President Som Mittal stated that the new U.S. visa fees hike proposed by U.S. Senator Charles Schumer was reduced from several years to one year based on India's coaxing. See Shefali Anand, *U.S. Visa Fees Extension Could Have Been Worse*, WALL ST. J. (Dec. 24, 2010, 3:53 PM), <http://blogs.wsj.com/indiarealtime/2010/12/24/us-visa-fee-extension-could-have-been-worse>; See Tripti Lahiri, *New Visa Fees 'Likely' Violate Trade Rules, Study Finds*, WALL ST. J. (Jan. 10, 2010, 3:49 PM), <http://blogs.wsj.com/indiarealtime/2011/01/10/new-visa-fees-likely-violate-trade-rules-study-finds> (quoting NASSCOM's comment on the high visa fees increasing costs to Indian technology firms by \$250 million); *Obama Signs Border Security Bill Despite Protests by Indian IT Cos.*, ECON. TIMES (Aug. 14, 2010), <http://economictimes.indiatimes.com/news/news-by-industry/services/travel/visa-power/Obama-signs-border-security-bill-despite-protests-by-Indian-IT-cos/articleshow/6308238.cms>. To what extent this statement of the Indian firms' influence is true or not is irrelevant for the purpose of this Article. I rely on these statements to make the more modest point that Indian software firms do comment in public and in print, and lobby with governments in both India and in the United States when adversely impacted. See also *Global Trade Development*, NASSCOM, <http://www.nasscom.org/initiatives/global-trade-development> (last visited Feb. 1, 2012).

¹²² For an example of Indian entrepreneurs in Silicon Valley's connections with government and influencing policy, see ANNALEE SAXENIAN, *THE NEW ARGONAUTS* 310 (2006). Saxenian recounts that Silicon Valley entrepreneur Kanwal Rekhi successfully lobbied for telecom reform in India and Silicon Valley entrepreneurs (including Indians) who spearheaded venture capital investment in India, even heading the Securities Exchange Board of India's Committee on Venture Capital.

¹²³ There is also no mention of IP laws in various studies documenting the several legal and regulatory interventions that facilitated the software industry. See, *e.g.*, Balaji Parathasarathy, *Globalizing Information Technology: The Domestic Policy Context for India's Software Production and Exports*, 3

The Indian software industry displays an apathy and complete disinterest in securing software under the property rubric. NASSCOM undertakes many activities such as promoting “Brand India” in software and leading various forums and initiatives in order to support industry. In sharp contrast, NASSCOM is silent on IP (or the need for any increase in IP laws).¹²⁴ NASSCOM and Indian software firms are not seeking IP protection, and yet it is arguably vital for industry growth.¹²⁵

4. Bottom-line Untouched by Intellectual Property

As a senior member of the management at a top-five Indian software firm explained, “[O]n an average, we earn 30–60 percent EBITDA [or Earnings Before Interest, Taxes, Depreciation and Amortization] for executing any project and that is more than sufficient.”¹²⁶ A senior software engineer, who has been implementing software projects for over a decade and is now leading teams executing projects for U.S. clients, further explained, “[P]atents are irrelevant to Indian software firms for all practical purposes, and constitute less than .01 percent of most Indian software firms’ bottom-line.”¹²⁷ The senior member of management who has served over two decades at this software firm corroborates the senior software engineer’s assessment: “Even if we are supremely generous, revenues from patent and intellectual property royalties constitutes no more than 1 percent of the total revenues for any of the top Indian software firms. And this does not exceed 3–5 percent of the total revenues, even in the financial products

ITERATIONS: INTERDISC. J. SOFTWARE HIST. 3 (May 3, 2004), available at <http://www.cbi.umn.edu/iterations/parthasarathy.pdf>.

¹²⁴ *Building The India Brand In Software*, NASSCOM, <http://epi.nasscom.in/Nasscom/templates/NormalPage.aspx?id=5355> (last updated Nov. 29, 2006). The interesting discussion on the evolution of NASSCOM priorities demonstrates that IP is not of major consequence to the larger companies, though it may be more pertinent to smaller companies. Moreover, the focus is on creating innovative and IP work, and not increasing the legal coverage of software (further evidence negating the IP-growth argument). See also *Reinventing Nasscom – Three Eras (A Story on EMERGE Forum)*, EMERGE COMMUNITY, NASSCOM (Feb. 11, 2010, 12:11 PM), <http://nasscom-emerge.groupsites.com/discussion/topic/show/286188>.

¹²⁵ It is theoretically possible that the increase in IT growth would have been greater if accompanied by more IP protection. However, this argument appears highly improbable in light of the industry response and, hence, shall be eliminated for the purpose of this Article.

¹²⁶ Interview with Management, *supra* note 112.

¹²⁷ Interview with senior software engineer of a top-five Indian software firm, Chennai, India, (Mar. 20, 2011). The interviewee preferred to remain anonymous because some of the shared information is confidential financial data related to the business of the firm.

division.”¹²⁸ The financial products division, or “vertical” in the software industry parlance, has the highest potential for IP revenue as it primarily involves sales of fully-developed software tools.

Clearly, the software industry is growing at a robust pace, fuelled by strong profits. Indeed, additional revenue from IP royalties appears unnecessary. On the basis of the software industry data from India, we can reasonably conclude that software will be produced even without property rights. Moreover, this industry data enables us to arrive at this conclusion without requiring us to first prove the counterintuitive argument—that altruistic motivations are more persuasive than property.¹²⁹ Thus, the Indian experience provides direct evidence that profits are sufficient, which relieves scholars of the requirement to establish the moral motivations of software engineers.

5. Responses to Anticipated Objections

Several objections to the interpretation of the Indian data may arise. The first objection is that the Indian software industry consists largely of low-end products and services.¹³⁰ It could be argued that India’s software industry primarily produces low-grade products and services (BPOs), or what are known as “call-centers.” However, call-centers do not primarily produce software programs, and are based on cost advantage. In other words, the Indian software industry’s output

¹²⁸ Interview with Management, *supra* note 112.

¹²⁹ For discussions on how altruistic or non-commercial motivation can be assessed and measured, see Clippinger & Bollier, *supra* note 90, at 266–75 (arguing for social trust and cooperation as an enduring theme in human evolution); Ghosh, *supra* note 71, at 164, 166 (arguing for cooking-pot markets and for studies of various motivation categories that exist as possible sources of value inflow). See also Rishab Aiyer Ghosh, *Cooking Pot Markets: An Economic Model for the Trade in Free Goods and Services on the Internet*, FIRST MONDAY (Mar. 2, 1998), <http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/580/501>.

¹³⁰ See, e.g., Economist Intelligence Unit, *India: Telecoms and Technology Background*, ECONOMIST (Feb. 1, 2005), http://www.eiu.com/index.asp?layout=ib3Article&article_id=1668066166&pubtypeid=1162462501&category_id=775133077&country_id=1570000157&page_title=Forecast&rf=0 (indicating that India did not historically develop innovative products and services, but also arguing that “faster growth in this segment is likely as Indian firms invest more heavily in research and development”). I do not argue whether or not Indian software firms’ products are “superior” or “inferior” to software industries located in any other country. The ECONOMIST article is however sufficient to demonstrate the more modest point that Indian software engineers or firms are capable of producing high-end products, and thus, disproving the argument that the industry is solely a low-end product producer, incapable of creating products worthy of IP protection.

does not meet the minimum standards to be eligible for patents or copyrights, which explains why industry does not pursue such protections. And so, the data from Indian industry arguably do not accurately reflect the impact of property rights. The figures, however, rebut this claim. BPOs have historically contributed less than 18–20 percent of the total revenues and did not exceed 50 percent even at its peak in 2009.¹³¹

A second and closely related objection is that the Indian industry’s success is perhaps primarily a result of cost advantage. As for the BPO objection, it could be argued that the software industry flourishes in India because labor is cheaper than in the United States. Hence, American firms outsource the software jobs to Bangalore, and the Indian data does not reliably answer whether innovation industries depend upon IP protections. This doubt is set to rest by existing American and other international scholarship.¹³² As Annalee Saxenian points out, post-Y2K, western countries recognized Indian firms are sources of scarce technical talent or high-quality services, *rather than just cheap labor*.¹³³ Indeed, Ashish Arora and Alfonso Gambardella argue comparative advantage “is simply too coarse to explain” India’s software advantage.¹³⁴

Moreover, even if we accept that comparative cost advantage provided the initial advantage, “access to a cheap and skilled workforce has [however] eroded over time.”¹³⁵ If cheap labor is the causal factor for

¹³¹ BPOs accounted for less than 18.2 percent and 20.1 percent of India’s total industry exports in 2003–04 and 2004–05. See NASSCOM, INDIAN IT-BPO INDUSTRY 2009, *supra* note 115.

¹³² See SAXENIAN, THE NEW ARGONAUTS, *supra* note 122; Asma Lateef, LINKING UP WITH THE GLOBAL ECONOMY: A CASE STUDY OF THE BANGALORE SOFTWARE INDUSTRY, ch. 2 (1997), available at <http://ilo-mirror.library.cornell.edu/public/english/bureau/inst/papers/1997/dp96/index.htm> (arguing that the revenues in the business of software development are largely in software packages and turnkey projects; while barriers to entry are too low in body-shopping, which suffered from reduced margins and had also become “logistically more difficult and financially less viable,” due to visa restrictions and other factors beyond the firms’ control).

¹³³ See SAXENIAN, THE NEW ARGONAUTS, *supra* note 122, at 276, 285 (emphasis added).

¹³⁴ See Ashish Arora & Alfonso Gambardella, *Bridging the Gap: Conclusions*, in FROM UNDERDOGS TO TIGERS: THE RISE AND GROWTH OF THE SOFTWARE INDUSTRY IN BRAZIL, CHINA, INDIA, IRELAND AND ISRAEL, 275, 289 (2005).

¹³⁵ *Id.* at 276. See also Suma S. Athreye, *The Indian Software Industry*, in FROM UNDERDOGS TO TIGERS: THE RISE AND GROWTH OF THE SOFTWARE INDUSTRY IN BRAZIL, CHINA, INDIA, IRELAND AND ISRAEL, 7, 33–34 (2005) (disproving the comparative cost advantage myth. Athreye analyzed the different periods in the

the industry's growth in India, then in the early 1990s, when the wages for software programmers increased in India, other countries such as China or the Philippines should have displaced India.¹³⁶ Instead, as demonstrated in Figure 1, when the cost advantage was eroding, the Indian software industry grew at an even faster pace.

A third objection to the evidence that India's information industry demonstrates that software industry does not require IP to flourish may be as follows. Perhaps, India does not develop innovative products and services eligible for protection under IP regimes.¹³⁷ However, the industry perception in the United States directly contradicts this idea: U.S. firms contracting with Indian software firms insist that all IP rights (including patents, copyright, residuary IP rights, and future development rights) stemming from the Indian software firm's work should be transferred to the U.S. firm. American firms would hardly insist that the Indian firm transfer all rights in IP to the U.S. firm if the work is low-end and not worthy of protection under IP laws in the first place.¹³⁸ A senior member of management and business head at a top-

growth of the software industry in India. Despite tight labor markets, there were over 30 percent increases in wages per annum in the mid-1990s for instance) (citation omitted). Ashish Arora et al. built on the Athreye evidence to argue that if it were just plain wage advantage, when Indian salaries rose and it was cheaper to hire Russian programmers, the software industry would have taken off in Russia and displaced India. However, even though Intel, Sun, and others established software development centers in Russia, the industry and exports remain small. Similarly, even though trained Russian engineers and scientists possessed backgrounds in software and computers, they were unable to successfully set up software firms when they migrated to Israel as well. See Ashish Arora, Alfonso Gambardella & Steven Klepper, *Organizational Capabilities and the Rise of the Software Industry in the Emerging Economies: Lessons from the History of some US Industries*, in FROM UNDERDOGS TO TIGERS: THE RISE AND GROWTH OF THE SOFTWARE INDUSTRY IN BRAZIL, CHINA, INDIA, IRELAND AND ISRAEL, 171, 197 (2005).

¹³⁶ Arora & Gambardella, *supra* note 134, at 276.

¹³⁷ Economist Intelligence Unit, *supra* note 130.

¹³⁸ It could be argued that because Indian firms do not protect their IP, it is potentially a "zero cost" insistence. This objection fails to explain why Indian firms would behave so irrationally. Given the global nature of software firms and services, if IP is critical, why would Indian firms not file patents in the United States or the United Kingdom where they operate and which provide strong patent and copyright protection for software? Rationally, the Indian software firms could then monetize the IP by adding a price tag to it and charging clients a fee for use of it. The senior management head of a top-five software firm in India confirms that any price quotes to clients are determined solely on project costs. There is no dollar value added directly or indirectly in

five Indian software firm confirms that U.S. firms insist upon such full transfers of all IP rights. He further adds, in the occasional situations when Indian firms asked to retain IP rights and were willing to reduce prices or compensate the U.S. firm, negotiations were delayed and unsuccessful.¹³⁹

Other indices also confirm software firms and engineers in India are as capable as their counterparts in other parts of the world. For instance, a significant number of Indian software firms figure prominently in the Bloomberg Top 100 IT companies, published in 2010.¹⁴⁰ Data indicates software engineers in India produce patentable software comparable to that of their U.S. counterparts. Such data includes instances of the U.S. Patent & Trademark Office (USPTO) granting patents to the Indian research wings of U.S.-based multinational corporations (MNCs),¹⁴¹ and Indian employees in MNCs like Intel are granted U.S. patents in numbers comparable to similarly situated American employees.¹⁴² A number of studies show “MNCs’

lieu of IP royalties or for transfer of IP to the client. Interview with Management, *supra* note 112.

¹³⁹ *Id.*

¹⁴⁰ Four of the top 20, and seven in the top 50, are Indian software companies—not counting Indian divisions of parent companies listed elsewhere. *The Tech 100*, BLOOMBERG BUSINESSWEEK, http://www.businessweek.com/interactive_reports/it100_2010.html?chan=technology_special+report+--+tech+100_specia (last visited Feb. 11, 2011).

¹⁴¹ See also Ashutosh Sheshabalaya, *Enduring an IT Eclipse*, YALEGLOBAL ONLINE (Aug. 30, 2005), <http://yaleglobal.yale.edu/content/enduring-it-eclipse>.

¹⁴² Saritha Rai, *In India, A High-Tech Outpost for U.S. Patents*, N.Y. TIMES (Dec. 15, 2003), <http://www.nytimes.com/2003/12/15/business/technology-in-india-a-high-tech-outpost-for-us-patents.html> (“The work of these engineers is generating significant amounts of intellectual property for American companies like Cisco Systems, General Electric, I.B.M., Intel, Motorola and Texas Instruments—whose various Indian units have filed more than 1,000 patent applications with the United States Patent and Trademark Office. Some applications, with patents already granted, date to the early 1990’s. . . . ‘Thirty percent of all software for Motorola’s latest phones is written in India,’ said Sammy Sana, managing director of Motorola India Electronics. . . . Mr. Prasad’s team has filed 6 of the 60 United States patent applications from Intel’s India unit in the last 22 months. . . . The center’s rate of innovation compares favorably with Intel’s mature development centers in the United States, said Mr. Sampat, the Intel president in India, who holds six patents for his work in the United States.”). See also John R. Allison, Abe Dunn & Ronald J. Mann, *Software Patents, Incumbents and Entry*, 85 TEX. L. REV. 1579, 1621 (2007) (arguing that, unlike the pharmaceutical and manufacturing industries, which have “monolithic perspectives on patent policy,” the software industry is more

R&D activities, especially in India, are quite isolated from the local network of technological activities,¹⁴³ but sorting through the reasons for this phenomenon is beyond the scope of this Article. For now, this evidence is adequate to assess Indian engineers' capabilities and counter any objection that Indian engineers are not capable of producing patent- or copyright-worthy programs.

A fourth anticipated objection is that the Indian industry is primarily "services-oriented" rather than "production-oriented," and because patents essentially protect products, the Indian industry is indifferent toward patents. This clichéd explanation that India is primarily a service provider rather than producing software products can be easily set to rest. Indian firms sell products to banks and clients in the finance industry, but even in this context, the royalties from IP do not contribute more than 1–3 percent of the total revenue, as discussed earlier.¹⁴⁴ Even if, *arguendo*, the lack of patent pursuit is because of the nature of the Indian industry's output, this story still does not explain why the industry does not pursue copyright protection in that case.¹⁴⁵ For instance, the unique selling point of Indian software firms is the sophisticated engineering capability they possess.¹⁴⁶ On this basis, they offer engineering R&D services to clients.¹⁴⁷ For example, Infosys, India's second-largest software firm, offers an ancillary service in the agricultural machinery manufacturing industry.¹⁴⁸ Infosys designs

fragmented and "each firm . . . seems to have a different position on patent policy—a position that is likely to change from time to time.").

¹⁴³ See, e.g., Marco Giarratana, Alessandro Pagano & Salvatore Torrisi, *The Role of the Multinational Companies*, in FROM UNDERDOGS TO TIGERS: THE RISE AND GROWTH OF THE SOFTWARE INDUSTRY IN BRAZIL, CHINA, INDIA, IRELAND AND ISRAEL, 207, 220 (Ashish Arora & Alfonso Gambardella eds., 2005) (arguing that, though Texas Instruments (India) has been awarded seventy-five patents by the USPTO from 1976 to 2002, its patents have never been cited by Indian firms). See *id.* at 219 for a discussion on this empirical study and its limitations.

¹⁴⁴ See *supra* Part II.A.3.

¹⁴⁵ A separate, alternate argument (and effective counter to this India-is-a-service-industry objection) is that information services (and services in general) will increasingly dominate society worldwide. See, e.g., Kenneth Dam, *Self-Help in the Digital Jungle*, in EXPANDING BOUNDARIES OF INTELLECTUAL PROPERTY 103, 104–05 (Rochelle Dreyfuss et al. eds., 2001).

¹⁴⁶ See, e.g., INFOSYS LIMITED, <http://www.infosys.com/services/Pages/index.aspx> (last visited Oct. 23, 2011).

¹⁴⁷ *Id.*

¹⁴⁸ B. K. SATHISH, CHALLENGES AND OPPORTUNITIES IN OUTSOURCING PRODUCT DESIGN & ENGINEERING, available at <http://www.infosys.com/engineering-services/white-papers/Documents/outsourcing-design-engineering.pdf> (last updated Jan. 2009).

“cabins, exteriors, structural components and detailed engineering activities.”¹⁴⁹ Even if the output from these services does not fit the novelty standards required for a patent (or a design right in Europe), the computer program for the cabin designs, detailed engineering activities could easily be copyrighted under U.S. or Indian laws. Nevertheless, Indian software firms do not pursue IP protection. This non IP-pursuing behavior on the part of Indian software firms is particularly odd when the standards for copyright and patent eligibility generally have been lowered in the U.S. and in other important economic markets.¹⁵⁰

A fifth potential objection to the persuasiveness of the Indian data is that Indian software growth is fuelled by global incentives (or IP protection under the Berne Convention, other international laws, or the laws of another nation).¹⁵¹ This concern may also be easily set to rest. There is no evidence that Indian firms are forum shopping or opting to file for patents or pursuing copyright protection in the United States (or other jurisdictions that provide more protection for software).¹⁵² Thus, we can eliminate the potential argument that external IP incentives may be driving innovation in India. The patent applications filed in India corroborate that IP is not driving the industry in India: MNCs and U.S. corporations applied for more patents than did Indian firms.¹⁵³ Annalee Saxenian articulates a subtler form of the global incentives argument: the software industry in India may be driven by India-born engineers in the United States.¹⁵⁴ This phenomenon may be a contributing factor, but it does not explain why India has been so successful in developing the

¹⁴⁹ *Id.* at 3.

¹⁵⁰ *See, e.g.*, Ginsburg, *supra* note 54, for discussion on much lowered copyright eligibility standards in the context of functional directories. This Article refrains from proceeding into the separate question of whether software patents are of lower quality than in other areas as it is not necessary for the purpose of this paper. For a discussion and analysis of this topic, *see generally* John R. Allison & Ronald J. Mann, *The Disputed Quality of Software Patents*, 85 WASH. L. REV. 297 (2007).

¹⁵¹ I thank Professor Dreyfuss for raising this interesting possibility.

¹⁵² *See* Interview with Management, *supra* note 112.

¹⁵³ Sheshabalaya, *supra* note 141 (“In just two years since the process formally took shape, Indian R&D centers of American tech firms were filing more patents than Bell Labs.”); *see also* ASHUTOSH SHESHABALAYA, *RIISING ELEPHANT: THE GROWING CLASH WITH INDIA OVER WHITE COLLAR JOBS AND ITS CHALLENGE TO AMERICA AND THE WORLD* (2004); Arora & Gambardella, *supra* note 134, at 293, 299 (arguing that supply of skilled labor and international links were critical conditions for a software model of development and this may not be easy to create).

¹⁵⁴ *See* SAXENIAN, *THE NEW ARGONAUTS*, *supra* note 122, at 286–87.

software industry when compared to China, Bangladesh, or several other countries that have sizeable expatriate population in the United States.¹⁵⁵

In sum, a number of the anticipated objections to the persuasiveness of the data from India can be set to rest. The following Part analyzes the IP laws and enforcement practices in India to demonstrate the IP regime is weak.

B. Weak Intellectual Property Protection

The IP regime in India is relatively weak and has remained so throughout the period of interest. Examining existing laws is crucial to determining if (i) the existing protection is robust or (ii) there is any secret sauce in Indian IP law that has created such idyllic conditions for software industry growth in India. Moreover, the analysis helps to eliminate an alternative explanation that perhaps Indian firms are not pressing for increases in IP because *a priori* protection is maximized or optimal. The following section shall resolve this concern by examining existing copyright and patent laws, thereby confirming IP protection remained weak throughout the period. Part II.B.1 will examine the extent of copyright protection, and Part II.B.2 shall eliminate the alternate causal story that perhaps the Indian industry is not pursuing copyright protection because they are protected sufficiently under patent law—a far more robust protection. Even though copyright is the main focus of this Article, as clearly explained in the Introduction, an examination of patent law will eliminate this alternate causal story.

1. Copyright – Almost Negligible Protection

Though software is protected under Indian copyright law, this protection is not particularly robust: (a) Indian copyright laws do not provide any special protection over and above other countries' laws, (b) software firms in the United States and in India made tacit arrangements to access each other's IP portfolios and did not pursue any infringement actions, and (c) ample studies documenting piracy in India (and the resulting revenue losses to software firms) negates any argument that copyright is *a priori* so well-protected that firms do not seek increases in property protection or sue for infringement.

First, like the United States, India provides copyright protection for software. The Indian Copyright Act of 1957¹⁵⁶ was amended in 1994

¹⁵⁵ The limitation of this emigrant theory is that it fails to explain why the industry took root in India and not in China, Europe or other countries from which the United States historically has a high number of immigrants. Further, Saxenian herself acknowledges elsewhere that it is about “Talent, Talent, Talent.” *Id.* at 285. *See, e.g.,* Arora, Gambardella & Klepper, *supra* note 135, at 197.

to include software within the definition of a literary work.¹⁵⁷ But the text does not indicate any additional protection in comparison to that which is available in other countries. The Indian Copyright Act (like U.S. copyright law) protects software against piracy or plain-vanilla copying and prohibits derivative programs.¹⁵⁸ The Act prohibits derivative programs because software is excluded from the definition of permissible “fair use.”¹⁵⁹ Hence, adopting part of a program or building upon it to create derivative works is illegal. The Indian Copyright Act even curtails plain-vanilla copying by lawful purchasers (for instance, a purchaser is permitted to use a program on only one machine).¹⁶⁰ It is worth noting, however, though these provisions prohibiting derivative work and limiting copying by lawful purchasers exist on the statute books, there is no evidence to suggest they are enforced.

¹⁵⁶ Indian Copyright Act, 1957, available at <http://copyright.gov.in/Documents/CopyrightRules1957.pdf>.

¹⁵⁷ *Id.* Section 2(o) of the 1957 Indian Copyright Act reads, “‘literary work’ includes *computer programmes*, tables and compilations including computer data bases” (emphasis added). See also § 2(ffb) for a definition of computer and § 2(ffc) for definition of computer programme. Section 2(ffb) reads, “‘computer’ includes any electronic or similar device having information processing capabilities”; § 2(ffc) reads, “‘computer programme’ means a set of instructions expressed in words, codes, schemes or in any other form, including a machine readable medium, capable of causing a *computer* to perform a particular task or achieve a particular result” (emphasis added).

¹⁵⁸ Computer programs have been excluded from the fair use defense. Section 52 reads, “Certain acts not to be infringement of *copyright*. 1. The following acts shall not constitute an infringement of *copyright* namely: a. a fair dealing with a *literary, dramatic, musical or artistic work* not being a *computer programme* for the purposes of—i. private use including research; ii. criticism or review, whether of that *work* or of any other *work*” (emphasis added). *Id.* The U.S. Copyright Code provides the same legal result but arrives at it from a slightly different path. It disallows adaptations as an infringing derivative work but allows for a limited exception when a “new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no such other manner.” 17 U.S.C. §117(a) (2006); *Krause v. Titleserv, Inc.*, 402 F.3d 119 (2d Cir. 2005).

¹⁵⁹ Indian Copyright Act, 1957.

¹⁶⁰ *Id.* Section 52 of the Indian Copyright Act reads, “Certain acts not to be an infringement of copyright. . . . (aa) the making of copies or adaptation of a *computer programme* by the lawful possessor of a copy of such *computer programme*, from such copy—(i) in order to utili[z]e the *computer programme* for the purpose for which it was supplied; or (ii) to make back-up copies purely as a temporary protection against loss, destruction or damage in order only to utili[z]e the *computer programme* for the purpose for which it was supplied” (emphasis added).

As a result of the 1994 amendments, piracy in computer software is a criminal offense, but the maximum sentence (three years imprisonment and/or \$1,200–4,800 or ₹50,000–2,00,000 as fines), is not particularly high.¹⁶¹ The fines are reduced (to \$1,200 or ₹50,000) if the infringer did not sell the illegal copies.¹⁶² The low fine is justified as commensurate with the low per capita income in India. Plainly, this low fine is not a major deterrent, and weakens any argument that Indian law may *a priori* provide robust copyright protection.

Second, the industry also appears to have adopted a far more relaxed infringement standard than that which is provided by law. Indeed, a senior management official of a top-five Indian software firm said, “Any program consists of thousands of lines of code. The question of copyright infringement only arises if the software programmer does a ‘copy and paste’ (or ‘cut and paste’). But if she remembers something and uses it (or memory recall insertions), it can hardly be copyright infringement.”¹⁶³ This illuminating comment reveals an industry attitude that is distinct from infringement standards recognized by U.S. and Indian copyright law today.¹⁶⁴

¹⁶¹ *Id.* Section 63B of the Indian Copyright Act states, “Knowing use of infringing copy of *computer programme* to be an offence. Any person who knowingly makes use on a *computer* of an infringing copy of a *computer programme* shall be punishable with imprisonment for a term which shall not be less than seven days but which may extend to three years and with fine which shall not be less than fifty thousand rupees but which may extend to two lakh rupees:

Provided that where the *computer programme* has not been used for gain or in the course of trade or business, the court may, for adequate and special reasons to be mentioned in the judgment, not impose any sentence of imprisonment and may impose a fine which may extend to fifty thousand rupees” (emphasis added).

¹⁶² *Id.*

¹⁶³ See Interview with Management, *supra* note 112.

¹⁶⁴ For the reader’s ease, I will use American case law here and introduce Indian legal tests only when Indian law on point is different. Because the United States has led in innovation and IP law developments, including pioneering case law, Indian law has been much influenced by, and draws heavily on, developments in American law. See Rachna Desai, *Copyright Infringement in the Indian Film Industry*, 7 VAND. J. ENT. L. & PRAC. 259, 264 (2005) (“Indian copyright laws resemble American copyright laws.”). See also *id.* for a discussion of the similarities between U.S. and Indian copyright law, including originality and various other copyright precepts. In fact, U.S. case law is often cited and relied upon by Indian judges. Interestingly, the Indian Supreme Court and High Courts have cited decisions by U.S. courts on IP law, such as *Diamond v. Chakrabarty*, 447 U.S. 303 (1980), rather than U.K. decisions on point. This is a notable departure from the practice of citing U.K. cases in constitutional or tort law, for

Conceivably, repeating code even from memory would constitute infringement under existing standards for copyright infringement. This standard is applied for other types of work protected under copyright law, such as music and literary work. Repeating portions of a tune or paragraphs of a literary work constitutes copyright infringement in both India and the United States.¹⁶⁵ Even subconscious copying constitutes infringement, and furnishing proof of deliberate copying or intention is unnecessary.¹⁶⁶ Moreover, striking similarity (or identical portions) would be sufficient, and access to the original work would be automatically presumed.¹⁶⁷ Striking similarity is even sufficient for summary judgment.¹⁶⁸ Indian courts apply the substantial copying test,¹⁶⁹ which is very similar to the substantial or striking similarity test

instance. Indian attorneys' briefs submitted to the courts also demonstrate a marked number of U.S. cases being cited in IP briefs. Furthermore, like U.S. copyright law, Indian copyright law also originates from British copyright law, which justifies the generality of this discussion. Copyright law was introduced in India by the Copyright Act of 1914, which essentially extended the British Copyright Act of 1911 to India. At the beginning, Indian copyright law borrowed extensively from the United Kingdom Copyright Act of 1956. Indian copyright is now governed by the Indian Copyright Act of 1957. *See, e.g.*, P. NARAYANAN, *COPYRIGHT LAW* (1986); *Copyright law of India*, WIKIPEDIA, http://en.wikipedia.org/wiki/Copyright_law_of_India (last modified June 27, 2011).

¹⁶⁵ *See, e.g.*, *Nichols v. Universal Pictures Corp.*, 45 F.2d 119 (2d Cir. 1930); *Arnstein v. Porter*, 154 F.2d 464 (2d Cir. 1946), *cert. denied*, 330 U.S. 851 (1947). For a similar rule in India, *see* *R.G. Anand v. Delux Films*, A.I.R. 1978 SC 1613 (India).

¹⁶⁶ *See, e.g.*, *Three Boys Music Corp. v. Bolton*, 212 F.3d 477 (9th Cir. 2000); *Bright Tunes Music Corp. v. Harrisongs Music Ltd.*, 420 F. Supp. 177, 181 (S.D.N.Y. 1976) (explaining infringement of copyright occurs even if “subconsciously accomplished.” In other words, when there is significant similarity and access, it will constitute infringement even if copying was not deliberately intended). *See also* NARAYANAN, *supra* note 164, §§ 14.10, 14.16 (1986) (discussing intention is not required in India either. Moreover, once similarity is proved, it can be relied on either directly or indirectly).

¹⁶⁷ *See, e.g.*, *ABKCO Music, Inc. v. Harrisongs Music, Ltd.*, 722 F.2d 988 (2d Cir. 1983) (holding access was presumed on the basis of the top-hit status of the plaintiff's song). *See also* NARAYANAN, *supra* note 164, §14.16.

¹⁶⁸ *See* *Repp v. Webber*, 132 F.3d 882 (2d Cir. 1997) (reiterating that striking similarity would by itself constitute proof of access sufficient to withstand summary judgment).

¹⁶⁹ INDIA DEPARTMENT OF SECONDARY AND HIGHER EDUCATION, *A Handbook of Copyright Law*, MINISTRY OF HUMAN DEVELOPMENT, GOVERNMENT OF INDIA, <http://www.education.nic.in/copyright.asp> (last visited June 5, 2011). *See also* NARAYANAN, *supra* note 164, §§ 14.11, 14.16 (stating India follows the

applied in the United States.¹⁷⁰ Hence, repeating significant portions of the code would most likely constitute infringement on the grounds that it is either a direct copy or a derivative work.¹⁷¹ India is silent on whether she will adopt the U.S. abstraction-filtration-comparison test¹⁷² for software infringement (as did the United Kingdom, Canada, and France).¹⁷³ Whether or not India adopts this specific test for software infringement, the industry still appears to have taken a view that meaningfully differs from the legal standard for infringement.¹⁷⁴

Tellingly, no Indian firm is addressing potential derivative work infringement. It is highly improbable that existing programs are not

substantial and material copying standard. Moreover, it is not only the quantity but also the quality of material copied that is also key).

¹⁷⁰ See *Substantial Similarity*, WIKIPEDIA, http://en.wikipedia.org/wiki/Substantial_similarity (last visited Apr. 11, 2011). For discussion on the *de minimis* requirement for infringement, what constitutes substantial similarity, etc., see also GORMAN & GINSBURG, *supra* note 47, at 526. Also, there exists a split on whether the substantial similarity should be tested vis-à-vis the whole of the copied portions or only compare the copied material after removing the uncopyrightable elements (such as facts, ideas, etc.). For discussion on these multiple approaches to substantial similarity, see *id.* at 554.

¹⁷¹ See, e.g., *Micro Star v. FormGen Inc.* 154 F.3d 1107 (9th Cir. 1998). In this case, FormGen Inc. owned, made, and distributed a very popular computer game. FormGen encouraged players to create their own levels and post them on the Internet for others to download. Micro Star downloaded these user-created levels onto CDs and sold them. Micro Star argued there was no derivative work infringement because, though the new user-levels reference the source art history, they did not actually contain the original art files themselves. The court disagreed and found derivative work infringement on the basis of ownership in sequels. In other words, the new levels would constitute sequels and FormGen would in this case own all the right to sequels as for traditional copyright subject matter such as literary works.

¹⁷² *Computer Assocs. Int'l, Inc. v. Altai, Inc.*, 982 F.2d 693 (2d Cir. 1992). See also Bruce Abramson, *Promoting Innovation In The Software Industry: A First Principles Approach To Intellectual Property Reform*, 8 B.U. J. SCI. & TECH. L. 75, 123 (2002); Jon O. Newman, *New Lyrics For An Old Melody: The Idea/expression Dichotomy In The Computer Age*, 17 CARDOZO ARTS & ENT. L.J. 691, 695–96 (1999). For a discussion on how the abstraction-filtration-comparison test is the computer program equivalent of the substantial similarity test, and on the exclusion of elements dictated by efficiency (or how the expression would be deemed to have merged with the idea, disallowing a monopoly right grant), see GORMAN & GINSBURG, *supra* note 47, at 564, 566.

¹⁷³ MARK A. LEMLEY ET AL., *SOFTWARE AND INTERNET LAW* 55 (3d ed. 2006).

¹⁷⁴ Other industries also appear to adopt similar relaxed standards of “remixing,” for instance, to suit industry needs. See, e.g., Hemphill & Suk, *supra* note 14, at 1196 (demonstrating that the fashion industry adopts a liberal standard for “remixing” to suit industry needs).

forming part of the code in new programs when programmers switch employers, set up new firms, or even work on projects for their firms’ new clients. The suggestion that programmers prefer to re-invent the wheel (or start from scratch) rather than utilize code they may have previously written or that is familiar seems implausible. Further, the argument that no program contains prior code is even more tenuous given the functional nature of software, which allows for limited methods to achieve any task in an efficient number of steps.

Interestingly, like its Indian counterpart, the U.S. software industry is applying a more blurred (or generous) infringement standard, albeit in the area of patents. Ronald Mann argues that, as a result of the “increasing complexity and interdependence of innovation,” all major firms need to access each other’s IP.¹⁷⁵ Moreover, “many of the most important firms are developing and selling products that at least infringe in some way on patents held by several other major players in the industry.”¹⁷⁶ The major firms could test the relative strengths of their portfolio through litigation, but are instead choosing to enter a web of cross-licensing agreements, *as formal or informal tacit arrangements*.¹⁷⁷

Remarkably, the software industries in the United States and in India exhibit near identical behavior, suggesting that perhaps this tacit cross-licensing arrangement is necessary for the software industry. The Indian software firms also do not pursue litigation or infringement actions, suggesting a tacit arrangement similar to that of the U.S. industry.¹⁷⁸ A senior management officer of a top Indian software firm assures “[t]here have been no known instances of an Indian software firm suing another firm for intellectual property infringement or entering into a settlement agreement for that matter.”¹⁷⁹ Because computer programs have been excluded from the fair use defense in India, and there is a high probability of derivative work infringement, this lack of litigation (or “zero IP disputes”) is striking. The senior management official clearly stated there is no known instance of an Indian firm pursuing infringement action in India or in any other country. Thus, we can put to rest the possibility of forum shopping or that litigation in other countries drives innovation in India. For instance, it could be argued Indian courts are reputedly slow and firms therefore prefer to litigate elsewhere. However, it would be rather absurd to argue IP protection is critical for industry growth when no firm or industry level body in India seeks to pursue IP safeguards.

¹⁷⁵ Mann, *Commercializing Open Source Software*, *supra* note 16, at 10.

¹⁷⁶ *Id.*

¹⁷⁷ *Id.* (emphasis added).

¹⁷⁸ *Id.*

¹⁷⁹ Interview with Management, *supra* note 112.

Many studies indicate high levels of piracy in India, weakening the potential argument that litigation is unnecessary because copyright is so well enforced in India. Diverse organizations ranging from the U.S.-based Business Software Alliance to the Government of India's Ministry of Human Resources Development have documented piracy losses in India. Estimates of losses stemming from piracy in the software industry range from \$151.3 million in 1995–96 (or 88.3 percent of the Indian market that year) to \$519 million in 2004.¹⁸⁰ Indeed, the numbers would be even higher if we included the losses from derivative works. The methodology these studies employ to compute precise figures may draw some criticism.¹⁸¹ For the purpose of this Article, however, these studies suffice to establish the simple point that an absence of infringement suits is not necessarily due to well-policed and enforced copyright in India.

Critics may point out that perhaps piracy affects non-Indian firms instead of Indian firms, and therefore Indian firms are indifferent to increases in IP protection and are not concerned with litigation and copyright policing.¹⁸² In support of the contrary, several studies provide estimates of losses incurred by Indian software firms. The BSA India Report points out “a 10-point reduction in the current 74 percent piracy rate would have enabled the [software] sector to have tripled its growth

¹⁸⁰ The U.S.-based Business Software Alliance in its India Country Report estimated losses of \$519 million in 2004 because of piracy. The BSA India Report estimates piracy losses grew by 74%, or was substantially higher than \$367 million in the previous year. THE BUSINESS SOFTWARE ALLIANCE, COUNTRY REPORT 2009 23 (2009) [hereinafter *BSA India Report*], available at http://www.bsa.or.jp/file/Country_One_Pagers.pdf (last visited Feb. 13, 2011). The Indian Ministry of Human Resources Development pegged losses from illegal application software at \$2.3 million (₹10.63 crores) in 1996–97 and also cited a NASSCOM study estimating the revenue losses from piracy at \$151.3 million (₹545,00,000), or 88.3% of the total Indian market in 1995–96. See N.K. NAIR ET AL., GOVERNMENT OF INDIA, MINISTRY OF HUMAN RESOURCES DEVELOPMENT, STUDY ON COPYRIGHT PIRACY IN INDIA 6 (1999) [hereinafter *Ministry of HRD Study*], available at http://www.education.nic.in/cr_piracy_study/cpr5.asp.

¹⁸¹ See, e.g., *BSA or Just BS? Software Theft is Bad; So Is Misstating the Evidence*, THE ECONOMIST (May 19, 2005), http://www.economist.com/node/3993427?story_id=3993427 (criticizing the computation methodology employed by the BSA India Report); *Ministry of HRD Study*, *supra* note 180 (criticizing the methodology employed by the BSA India Report and the NASSCOM study).

¹⁸² See, e.g., *Ministry of HRD Study*, *supra* note 180 (arguing Indian firms are mostly involved in customized software and not packaged software). Since piracy occurs mostly with packaged software, which is largely imported, Indian firms are to a great extent unaffected by piracy. This Study however estimates the Indian government lost import duties equivalent to \$15 million (or 10% of the \$151.3 million that had been diverted from legal software).

from \$7.4 billion to \$19.5 billion and added 364,000 [software] jobs in the process.”¹⁸³ The BSA India Report further argues (a) India has more to gain than most from piracy reductions as it would increase local industry revenues by more than \$8.2 billion, and would generate \$386 million in tax revenues,¹⁸⁴ and (b) if the growth-inhibiting 74 percent software piracy rate is reduced, India’s future growth would accelerate to 165 percent instead of 137 percent in 2004 to 2009, and more revenue would be generated for India.¹⁸⁵ The BSA India Report also argues that losses in the domestic market alone amount to \$7.4 billion.¹⁸⁶ Yet, as the senior management official of a top-five software firm confirms, Indian software firms have not withheld sales of any product in India because of copyright infringement concerns.¹⁸⁷

If the BSA India Report is indeed correct, that curbing piracy will accelerate growth, then why are Indian firms uninterested in IP protection and enforcement? If it is indeed correct that IP protection is vital for industry, why are Indian firms not pursuing infringement actions or lobbying for piracy crackdowns?¹⁸⁸ Instead, the well-regarded software industry in India is strikingly silent and does not endorse IP protection.¹⁸⁹ To the contrary, several of India’s largest software firms

¹⁸³ *BSA India Report, supra* note 180.

¹⁸⁴ *Id.*

¹⁸⁵ *Id.* According to the BSA India Report, the additional growth would provide India more revenues—\$1.1 billion in extra tax revenues per year, and \$30 billion in additional revenues per year.

¹⁸⁶ *Id.*

¹⁸⁷ Interview with Management, *supra* note 112.

¹⁸⁸ It is noteworthy that Indian software firms are not filing IP infringement actions against each other. By contrast, Indian corporations often engage in litigation on a number of other matters. For instance, Tata Group, India’s leading corporate house and parent to Tata Consultancy Services (India’s top software firm), sues on a number of matters, as does Reliance Group and most corporations in India. Simply stated, Indian firms understand Indian court requirements and have no qualms in filing suits in a number of areas of law. This fact resolves a potential objection that perhaps Indian firms prefer not to litigate because court processes are slow and time-consuming. I thank Professor Thomas Merrill for raising this interesting observation.

¹⁸⁹ For a detailed discussion of the software industry’s contribution to the economy, global perception of India, and well-organized lobby, see *supra* Part II.A. For the role of software in the economy, see INDIA IN BUSINESS, INFORMATION TECHNOLOGY AND INFORMATION TECHNOLOGY ENABLED SERVICES (ITES), <http://www.indiainbusiness.nic.in/industry-infrastructure/ser vice-sectors/it.htm> (last visited Feb. 13, 2011).

support open source development,¹⁹⁰ just as some firms in the United States do.¹⁹¹

The IP regime in India is relatively weak and has remained so throughout the period of interest. The reasonable conclusion is that the software industry does not depend upon copyright. This narrative is particularly compelling because it emerges from the fastest growing software industry in the world.¹⁹²

2. Patent Protection – Disinterested Industry

This Article focuses on the relationship between software and copyright law, but to eliminate patent as an alternate causal story, this Part will discuss how the industry is equally unaffected by patent cover. As alluded to in Part II.A, a law providing patents for software was introduced in India in 2004 and subsequently withdrawn in 2005. These events allow scholars to observe whether the industry was affected by an increase or decrease in IP protection. This Part will examine these two “experiments” in patent law and their effect on the software industry. However, with regard to patents, this Article shall confine itself to this limited question as it is not intended to be an analysis of patent law *per se*.¹⁹³

¹⁹⁰ Wipro and HCL Infosystems, the second- and fifth-largest Indian software firms, support open source. *See, e.g.*, Press Release, Red Hat Strengthens Partner Network in Northern India, RED HAT (Nov. 5, 2006), <http://www.apac.redhat.com/news/article/490.html>. For more details on Wipro, see WIPRO IT BUSINESS, <http://www.wipro.com/index.htm> (last visited Feb. 13, 2011) (explaining that Wipro is one of the largest Indian IT companies generating revenues over \$6.03 billion in 2010, employing over one hundred thousand employees, and rated as the ninth most valuable brand in India). For more details on HCL, see HCL, <http://www.hcl.in/> (last visited Feb. 13, 2011) (explaining that HCL is the fifth largest Indian IT enterprise with annual revenues of \$5.5 billion after its founding in 1976 as a garage start-up).

¹⁹¹ *See* Dreyfuss, *supra* note 11, at 1451–52, nn.101–02.

¹⁹² Note that some public statements have been made to the effect that India is cracking down on piracy. *See, e.g.*, NIRUPAM BAJPAI & VANITA SASTRI, SOFTWARE INDUSTRY IN INDIA: A CASE STUDY 8 (Harvard Inst. for Int’l Dev., Discussion Paper No. 667, 1998), *available at* <http://www.cid.harvard.edu/h iid/667.pdf>; *IPR Law in India*, NASSCOM, <http://epi.nasscom.in/Nasscom/templates/NormalPage.aspx?id=6250> (last updated June 30, 2006) (claiming that Indian copyright laws are some of the toughest in the world and that consequently “abuse has been reduced,” and “raids have had salutary effect.”). There is, however, no evidence supporting such claims of anti-piracy crackdowns.

¹⁹³ For a general discussion about issues related to software patents, see ROBERT MERGES & JOHN DUFFY, PATENT LAW AND POLICY: CASES AND MATERIALS 131–41, 151–65 (3d ed. 2002).

Accordingly, this Part will cover a number of discrete ideas. (i) The Indian software industry does not endorse or advocate for software patents. (ii) Despite industry disinterest, and though the Trade-Related Aspects of Intellectual Property Rights Agreement (TRIPS Agreement) did not require it, the Indian government included software patents within the amendments proposed to comply with the TRIPS Agreement. (iii) Software programmers, the main intended beneficiaries of this government initiative, criticized software patents. (iv) Industry did not endorse the government’s software patent proposal, in striking contrast to its reaction to other laws. (v) Further, statistics reveal non-software firms are filing most of the applications for software patents, which suggests the industry does not depend upon patents to fuel growth.

Providing patents for software is another method of considerably strengthening IP barriers. However, Indian firms and software programmers are not lobbying for or even endorsing patent safeguards for software. NASSCOM, as indicated earlier, is “the industry association for the IT-BPO sector in India,” and its member firms represent over 95 percent of India’s software industry.¹⁹⁴ NASSCOM, in conjunction with the Boston Consulting Group, published the NASSCOM-BCG Innovation Report, *Unleashing the Innovation Power of IT-ITES Industry*.¹⁹⁵ This Report studied the factors the industry needs in order to continue growth, and makes no mention of the need for patents (or any increase in IP protection for that matter).¹⁹⁶

Nevertheless, in 2004, India introduced software patents as part of the amendments proposed to harmonize Indian patent law with the TRIPS Agreement, and despite the fact that the TRIPS Agreement did not require software patents.¹⁹⁷ The proposal suggested an amendment to

¹⁹⁴ See *Vision and Mission*, NASSCOM, <http://www.nasscom.in/vision-and-mission> (last visited Dec. 18, 2011).

¹⁹⁵ NASSCOM & BOSTON CONSULTING GROUP, NASSCOM-BCG INNOVATION REPORT 2007: UNLEASHING THE INNOVATION POWER OF IT-ITES INDUSTRY (2007), available at <http://www.scribd.com/doc/221385/Nasscom-BCG-Innovation-report-2007India> (last visited Dec. 18, 2011).

¹⁹⁶ See *id.* Strikingly, the Report focuses on the need to increase the number of IP-driven firms but does not advocate any need for patent or additional IP laws. In this context, it is difficult to be persuaded that industry requires IP protections in order to flourish, and yet does not request increases in IP laws.

¹⁹⁷ As a signatory of the TRIPS Agreement, India was obligated to amend its patent laws by Jan. 1, 2005 to bring it into conformity with the conditions laid down in the TRIPS Agreement. Though the initial deadline was January 2000, Art. 65.4 of the TRIPS Agreement extended the deadline to January 2005 for developing countries like India, which did not provide product patents. India availed itself of this shelter and, hence, was required to amend its patent law by no later than Jan. 1, 2005. See Prabhu Ram, *India’s New “TRIPS-Compliant”*

the provision listing the exclusions, or subject-matter, which could not be patented.¹⁹⁸ Indian firms did nothing to endorse or support this initiative to secure more protection via patent law.

Instead, software programmers and others members of the industry argued against the patent proposal.¹⁹⁹ Indeed, many programmers in India organized and participated in a candlelight vigil to protest against software patents.²⁰⁰ Legal scholars and constitutional experts believed it was improper for the government to introduce this provision as part of the amendments intended for TRIPS compliance.²⁰¹

Patent Regime, 5 CHI.-KENT J. INTELL. PROP. 195, 196 (2006). We can eliminate the potential argument that industry lobbied the government to introduce patents. See, e.g., Prabir Purkayastha, *Software Patenting: Huge Blow for India*, 29 PEOPLE'S DEMOCRACY 5 (2005), available at http://pd.cpim.org/2005/0130/01302005_snd.htm.

¹⁹⁸ The provision excluding software was redefined. Patents were allowed for "technical applications" when "combined with hardware," thereby effectively reversing the exclusion. See Statement by Kamal Nath, Minister of Commerce and Industry (on the Ordinance providing for software patents), Dec. 27, 2004, 17:41 IST, available at <http://pib.nic.in/newsite/erelease.aspx?relid=6074> (last visited Dec. 20, 2011).

¹⁹⁹ Software programmers and others criticized patent protection for software as unsuited to the nature of software and inimical to innovation. Moreover, they argued it is plainly incongruent to provide patent cover if software is combined with hardware. See, e.g., Richard Stallman, Speech at the Government Model Engineering College, India: The Danger of Software Patents (Feb. 11, 2009), available at <http://www.gnu.org/philosophy/stallman-mec-india.html> (criticizing the Indian Ordinance creating software patents and discussing the problems of software patents in general). For criticisms of the Ordinance in India, see Siddharth Narain, *A Costly Prescription*, 22 THE FRONTLINE 4 (2005), available at <http://www.hindu.com/fline/fl2204/stories/20050225002609700.htm>; *FSF India's Response to the Draft Patents Manual*, FREE SOFTWARE FOUNDATION OF INDIA, <http://www.gnu.org.in/fsf-indias-response-to-the-draft-patents-manual/> (last visited Apr. 13, 2011). For similar criticisms of the U.K. proposal and efforts to introduce software patents in Europe, see posting of Leader, *Software Patents Make a Mockery of European Ideals*, ZDNETUK (Mar. 7, 2005, 1:35 PM), <http://www.zdnet.co.uk/news/compliance/2005/03/07/software-patents-make-a-mockery-of-european-ideals-39190515/>.

²⁰⁰ See *Candle Light Vigil Against Software Patents*, FREE SOFTWARE FOUNDATION OF INDIA, <http://www.gnu.org.in/candle-light-vigil-against-software-patents> (last visited Nov. 12, 2011).

²⁰¹ See Amit Sen Gupta, Side Effects: Patents Ordinance to hit Pharma, Software Sectors, THE TIMES OF INDIA (Feb. 17, 2005), http://articles.timesofindia.indiatimes.com/2005-02-17/edit-page/27831690_1_new-patent-regime-patent-law-patents-act ("The new Ordinance has supposedly been brought in to make the Patent Act TRIPS-compliant. The old Act (modified in 2002) has exactly the language given in TRIPS on this count, so it was TRIPS-compliant. Therefore,

There are many reasons why the software industry may have problems with patents. Empirical studies in the United States now indicate, even though “the patent monopoly is most commonly justified on the ground of providing incentives to innovate,” “patents offer relatively mixed to weak incentives to engage in innovation” in the high technology software industry.²⁰²

First, granting software patents increases the price of software products and services. Software firms may engage in defensive patenting to avoid infringement claims and thereby set off a “patent arms race.”²⁰³ As Colleen Chien explains, building a patent arsenal is one of the top reasons high-tech companies get patents—so that they can guard against the risk of expensive patent litigation.²⁰⁴ Unlike copyright, which attaches automatically at the time of creation, a patent involves expensive filing procedures. Costs will multiply in the case of software as firms will need to duplicate application filings in the various jurisdictions where the software firm operates (or provides services). The higher costs and resulting losses in demand and industry growth are not included by studies advocating for patents or estimating losses from piracy.²⁰⁵

Providing patent coverage for software also creates an additional license tier as firms must identify and negotiate cross-licensing permissions, driving up the associated legal fees and transaction costs. Ronald Mann argues there are indirect benefits from cross-licensing.²⁰⁶

the attempt to bring in software patenting through the new Ordinance, under the guise of meeting the TRIPS deadline, is completely mala fide.”)

²⁰² Stuart J.H. Graham et al., *High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey*, 24 BERKELEY TECH. L.J. 1255, 1283 (2009), available at http://www.btlj.org/data/articles/24_feature.pdf.

²⁰³ See Colleen Chien, *From Arms Race to Marketplace: The Complex Patent Ecosystem and Its Implications for the Patent System*, 62 HASTINGS L.J. 297, 299 (2010).

²⁰⁴ See *id.* For a discussion of this objection in the context of software patents in India, see also Purkayastha, *supra* note 197. See also *Meeting the Global Competition A Challenge for Indian Software Companies*, NAAVI.ORG (Mar. 29, 2003), http://www.naavi.org/cl_editorial_03/edit_29_mar_03_01.htm. For a discussion on the trouble with trolls, see Robert Merges, *The Trouble with Trolls: Innovation, Rent-Seeking, and Patent Law Reform*, 124 BERKELEY TECH. L.J. 1583, 1586 (2009) (discussing Justice Kennedy’s opinion in the Supreme Court decision of *eBay, Inc. v. MercExchange, L.L.C.* “An industry has developed in which firms use patents not as a basis for producing and selling goods but, instead, primarily for obtaining licensing fees.” (internal citations omitted)).

²⁰⁵ See *supra* Part II.B.1 for a discussion of piracy loss studies.

²⁰⁶ Mann, *Financing*, *supra* note 18, at 962.

But he firmly rejects “patent use as a net benefit to the industry: absent some other benefit, all firms would be better-off saving the costs of obtaining patents.”²⁰⁷ Moreover, James Bessen’s 2011 study reveals the increases in litigation risks associated with software patents.²⁰⁸ Bessen further states, “[S]oftware patents were much more likely than other patents to be involved in litigation,”²⁰⁹ and “the high litigation rates might imply high social costs that would outweigh these meager benefits. In addition, the litigation might also create disincentives for investing in innovation.”²¹⁰ On that basis, Bessen concludes, “[F]indings suggest that the extension of patent eligibility for software might not have been socially beneficial, at least not for the software industry.”²¹¹

Moreover, software programmers argue they would not gain from patents in the first place.²¹² Under standard work for hire contracts, the employer owns any IP that may result from the employee’s work. It could be argued that employment or compensation may be contingent on creating patentable work, and the software programmer could therefore benefit from producing IP.²¹³ But the facts and figures clearly indicate otherwise. As discussed in detail earlier, income from IP royalties contributes less than 1 percent of software firms’ overall revenues,²¹⁴

²⁰⁷ *Id.* Moreover, providing patents creates additional licensing problems. Because technology transforms so rapidly, drafting licensing contracts for software is difficult. For a discussion on software licenses and the problems of distributing tangible and intangible materials, see Michael J. Madison, *Reconstructing the Software License*, 35 LOY. U. CHI. L.J. 275 (2003).

²⁰⁸ James Bessen, *A Generation of Software Patents*, (Boston Univ. School of Law, Law & Economics Research Paper No. 11-31, 2011), available at <http://ssrn.com/abstract=1868979>.

²⁰⁹ *Id.* at 3 (citations omitted).

²¹⁰ *Id.*

²¹¹ *Id.*

²¹² *Patents Will Harm India’s Software Industry*, ONLYPUNJAB.COM (May 30, 2005, 12:31 PM), <http://onlypunjab.com/fullstory2k5-insight-news-status-12-newsID-7074.html>. (For instance, Anand Babu, a Silicon Valley programmer who helped build “Thunder,” one of the fastest computers in the world, pointed out that software patents had not helped developers, including in the United States. Nagarjuna, a software programmer in India, further argued that patents for software in combination with hardware were illogical.) Note that software developers surveyed in the United States in 1992 and 1996 and software firms surveyed in the 1990s also opposed software patents. Hence, software developers’ opposition to patents is not a singularly Indian feature, but suggests it may be far more common than previously anticipated. See Bessen, *supra* note 208, at 2.

²¹³ I thank Professor Rochelle Dreyfuss for pointing out this potential objection, which would have been troubling if left unaddressed.

²¹⁴ See *supra* Part II.A.2.

thus, patent expectations from employee work are not central to the decision to hire.²¹⁵ Software programmers are not required to secure patents or copyright as part of their job profiles or goals, and there is no evidence in employment contracts or periodic employee appraisals to suggest otherwise. The facts on the ground therefore demonstrate that IP does not act as an indirect incentive to innovate via payroll.

Continuing with the Indian patent story, the Parliament rejected an amendment that proposed patent measures for software. The Indian Parliament’s reasoning was very similar to that of the European Commission, which rejected the United Kingdom’s proposal to provide software patents by one of the highest voting margins in the history of the European Union.²¹⁶ The European Commission’s rejection was

²¹⁵ Robert Hunt & James Bessen, *The Software Patent Experiment*, BUS. REV., Q3 2004, at 22, 25–26, available at <http://www.phil.frb.org/files/br/brq304rh.pdf>. Bessen and Hunt’s study also alludes to similar findings in the United States. Software publishing and software services industries together accounted for only 7% of software patents during the 1990s, even though they employed 33% of computer programmers. Evidently, patent expectation from employment work was also not central in the United States.

²¹⁶ Initially, the European Council adopted the Computer Implemented Inventions Directive in March 2005. This was heavily criticized as being adverse to Small and Medium Sized Enterprises (SMEs) and innovation. See John Thomas, Letters to the Editor, *EU Patent Ruling Will Slow Pace of Innovation*, FIN. TIMES (June 23, 2005), <http://www.ft.cms/s/0/052d46ca-e385-11d9-b6f0-00000e2511c8.html-axzz1dhrDZcJ2>. But in the end, by the most decisive vote in its history, the European Parliament rejected the collaborative Directive, a move that was supported by most technology companies. See Tobias Buck, Maija Pesola, & Raphael Minder, *Drive Fails for Common Software Patents in EU*, FIN. TIMES (July 5, 2005), <http://www.ft.com/intl/cms/s/2/6f8da74e-ed8f-11d9-9ff5-00000e2511c8.html>; see Tobias Buck, *EU’s Lawmakers Reject Software Patent Legislation*, FIN. TIMES (Feb. 18, 2005), <http://www.ft.com/intl/cms/s/0/6b002898-8154-11d9-a8de-00000e2511c8.html-axzzldhrDZcJ2>. However some argue the issue continues to surface in Brussels. See, e.g., Ingrid Marson, *Lobbyists Prepare for Next Software Patent Battle*, ZDNET (Jan. 23, 2006), <http://www.zdnet.co.uk/news/regulation/2006/01/23/lobbyists-prepare-for-next-software-patent-battle-39248676/>. Microsoft even allegedly threatened to pull out Navision, a Danish subsidiary, if software patents were not granted. For such allegations by sources close to Navision and denials by Microsoft, see *Microsoft: Give us Software Patents or we Move 800 Jobs Out of Denmark*, FFII, <http://wiki.ffii.org/Navision050215En> (last visited Dec. 20, 2011). The U.K. had proposed the inclusion of patents for software. See, e.g., *Patenting Computer-Implemented Inventions (Software Patents)*, INTELLECTUAL PROP. OFF., <http://www.ipo.gov.uk/p-policy-computer.htm> (last visited Feb. 13, 2011) (showing U.K. justification for software patents based on contribution); see *Intellectual Property Office Approves Software Patent for UK*, THE REGISTER (May 7, 2009), http://www.theregister.co.uk/2009/05/07/ipo_

significantly influenced by the European Economic and Social Committee's Opinion published in September 2002.²¹⁷ The Committee's main legal objection was that the doctrinal premise of the Proposal—the distinction between “computer software by itself” and “software producing technical results”—was “indefinable” and “the product of legal casuistry.”²¹⁸

In India, the software patent bill may have gained some traction if software firms or NASSCOM had endorsed it. The industry enjoys popular support for re-inventing the Indian image internationally,²¹⁹ and Nandan Nilekani, one of the founders of Infosys Ltd., is now an Indian

approve_software_patent/ (announcing a software patent because of “technical contribution”); see Nokia Corporation [2009] BL 0/107/09 Intellectual Prop. Off. (appeal taken from GB0424655.9), available at <http://www.ipo.gov.uk/o10709.pdf> (software patent grant decision).

²¹⁷ The European Economic and Social Committee's Opinion is a part of the EU's mandatory legislative process. See Justine Pila, *Software Patents, Separation of Powers, and Failed Syllogisms: A Cornucopia from the Enlarged Board of Appeal of the European Patent Office*, 70 CAMBRIDGE L.J. 203, 210–11 (2011).

²¹⁸ Opinion of the Economic and Social Committee on the “Proposal for a Directive of the European Parliament and the Council on the Patentability of Computer-Implemented Inventions,” [2003] OJ C61/154 [3.1] [hereinafter ESC Opinion]. According to Justine Pila, this Opinion criticized the Proposal as a partisan document that lacked a sound economic basis, showed insufficient regard for public interest and democracy, and put Europe at risk of increased legal uncertainty, and perhaps even “legal chaos.” See Pila, *supra* note 217, at 207. Moreover, the proposal was criticized as offering a “de facto acceptance and justification of the *a posteriori* drift of EPO jurisprudence,” ESC Opinion, at [3.1.1], eliminating the technological effect requirement of European Patent law, for instance. See Pila, *supra* note 217, at 207. See also JUSTINE PILA, *THE REQUIREMENT FOR AN INVENTION IN PATENT LAW 242* (Oxford Univ. Press ed., 2010). The European saga shared several similarities with the Indian episode. The proposed Directive was criticized for content and the manner in which it was formulated, much like the Ordinance in India. See *supra* Part II.B.2.

²¹⁹ IT BPO SECTOR IN INDIA, *supra* note 114, at 1. (“The IT-BPO sector has become one of the most significant growth catalysts for the Indian economy. In addition to fuelling India's economy, this industry is also positively influencing the lives of its people through an active direct and indirect contribution to the various socio-economic parameters such as employment, standard of living and diversity among others. The industry has played a significant role in transforming India's image from a slow moving bureaucratic economy to a land of innovative entrepreneurs and a global player in providing world class technology solutions and business services. The industry has helped India transform from a rural and agriculture-based economy to a knowledge based economy.”)

Cabinet Minister.²²⁰ The industry is also considerably well organized through NASSCOM and other associations, and has consistently spoken up when affected by laws in India or the United States.²²¹ However, no Indian firm endorsed the software patent bill, nor did any firm protest Parliament’s decision to reject the proposed amendment. There is also no record of lobbying or support from NASSCOM or any other industry-level body.²²²

Tellingly, the software industry remained silent even when the Indian Patent Office gave retrospective effect to Parliament’s action. The Indian Patent Office declared not only that it would not grant software patents in the future (as per Parliament’s pronouncement), but also went several steps further. The government passed an ordinance providing for software patents in December 2004 (Ordinance), and the Ordinance was in effect until April 2005 when the legislature rejected the proposal. The Indian Patent Office declared patents granted when the Ordinance was in effect were invalid not only in the future, but also during the four-month period when the Ordinance had been the law in India.²²³ The Indian Patent Office evidently believes this move will not be viewed unfavorably by the courts even though, as a general rule, Indian courts disapprove of laws providing retrospective effect—even when passed by the Legislature, let alone by administrative bodies. Arguably, a nudge from the popular software industry would have tipped the scales against retrospective application because the Ministry for Industry in India had proposed software patents of its own accord.²²⁴ Further, software firms could have argued the proposal was only a “small additional step”—even independent of this draft legislation, software patents are granted for

²²⁰ Vikas Bajaj, *India Undertakes Ambitious ID Card Plan*, N.Y. TIMES (June 25, 2009), <http://www.nytimes.com/2009/06/26/world/asia/26india.html?ref=nandanmnikani>. See also *About UIDAI*, UNIQUE IDENTIFICATION AUTHORITY OF INDIA, http://uidai.gov.in/index.php?option=com_content&view=article&id=141&Itemid=164 (last visited, Feb. 1, 2011) (“Shri. Nandan M. Nilekani as Chairman of the Unique Identification Authority of India, in the rank and status of a Cabinet Minister for an initial tenure of five years. Mr. Nilekani has joined the UIDAI as its Chairman on 23 July 2009.”)

²²¹ *Id.*

²²² See *supra* Part II.B for NASSCOM’s discussion on the need to build Brand India and the contrasting disinterest to secure additional IP protection.

²²³ The patents that were granted in the period between the promulgation of the Ordinance and the subsequent Amendments (between December 2004 and March 2005) were reversed by the Patent Office. See *Software Patents Under Ordinance Face Reversal*, FIN. EXPRESS (NEW DELHI) (Mar. 29, 2005), http://www.financialexpress.com/fe_full_story.php?content_id=86454.

²²⁴ See discussion *supra* Part II.A.1 on NASSCOM and Indian IT firms’ lobbying efforts on the face of regulations that have impacted the industry.

practical application or technical effect, and so, providing patent protection for software per se would only be a small additional step.²²⁵

The software patent applications filed for practical application or technical effect present additional means to check for industry response to patents. Curiously, individuals rather than corporations filed the majority of applications, and applications were filed much more often by foreign firms than by Indian software firms.²²⁶ Of the 150 patents granted for “technical application of software,” even prior to the Ordinance, non-software MNCs like LG, Nokia, Philips, and Samsung had filed a vast majority, while Indian software firms had filed comparatively few.

The story so far demonstrates the strong growth of the Indian software industry has been unaffected by an increase or decrease in patent safeguards. By the same token, industry does not appear to make any attempt to secure patents, signaling how little IP protection matters to industry. The industry’s reaction is unsurprising given the costs patents create. Patents impose a licensing tier and increase costs and litigation risks (in turn, creating business uncertainties).²²⁷ Not only are patents unnecessary for software, but they also have several adverse effects.

²²⁵ It cannot be argued that software firms do not lobby for patent protection because they in effect obtain patents utilizing this indirect provision. Multi-national corporations, U.S. firms, and electronic firms—rather Indian software firms—filed and secured the vast majority of software patents in India. See *Patenting in Electronics*, INTELLECTUAL PROP. RTS., Apr. 2000, at 4, available at <http://www.indianpatents.org.in/fac/april2k.pdf>.

²²⁶ The Patent Facility Centre (PFC) study revealed that patent fees for filings by individuals (approximately \$20–25 or ₹1000) were lower than the fees for corporate filings (\$100–125 or ₹5000). See *Individuals Dominate Patent Filing*, HINDU BUS. LINE, Nov. 6, 2002, available at <http://www.thehindubusinessline.in/2002/11/06/stories/2002110602690100.htm>.

²²⁷ See Dreyfuss, *supra* note 11, at 1441–42 (arguing the rights proliferation has created additional problems that are magnified in the knowledge economy). Dreyfuss argued that with the “product-to-right ratio” changed, products are associated with more than one IP right. *Id.* at 1442 (“For example, bringing a video game to market can require licenses to copyrights, trademarks, celebrity images—and to hundreds of patented software subroutines. In that environment, costs multiply and hold-outs become increasingly likely.”). Dreyfuss also argued that patents being moved “upstream” to cover a broad swath of inventive opportunities has resulted in potential inefficiencies. (It is unclear whether rights holders have the capacity to fully mine their claims). *Id.* See also LESSIG, *FREE CULTURE*, *supra* note 1, at 102–114 (discussing how innovators and business would be constrained “by the massive threat of liability tied to the murky boundaries of copyright law.”).

To sum up, this Part confirms that industry does not rely on IP protection for growth. First, periods of high growth appear unrelated to increases in IP protection.²²⁸ Second, copyright protection and IP rights in India are weak, and have remained so throughout the period of interest. Third, the industry, which is the principal intended beneficiary of software patents, does not endorse the patent proposal. Finally, on the basis of tacit arrangements in the industry in the United States²²⁹ and India, we are left with the question of whether it is strong IP protection the industry really needs.

The commercial software industry in India provides the first proof of “IP without IP.” Indeed, we have clear corroboration that the traditional law and economics prescription—more property rights will result in more growth—does not work in the software industry. This case study provides the evidence that U.S. Congress and judges look for in order to limit copyright expansions. The study of the commercial software industry in India demonstrates profits alone are sufficient incentive for software production and relieves scholars of any enquiry into the motivations of software programmers, unlike the Internet Studies. In addition, this commercial industry data cannot be easily dismissed by the property intuition that prevents the open software experience from placing limits on copyright expansions. Once we comprehend that the software industry does not rely on, or even appear concerned with, formal IP rights, we are no longer surprised that individual programmers are putting up code for free. Hence, this Part fills a critical gap in American literature and leads us into Part III.

III. A “SECOND GIFT” FROM THE COMPARATIVE ANALYSIS

Several leading American scholars have put forward several other theories to explain the factors contributing to the growth of the U.S. software industry. For instance, Professors Ronald Mann and Ronald Gilson have endorsed, alternate legal theories for the growth of the software industry.²³⁰ One concern with these studies is, absent corroboration, scholars run the risk of mistaking correlation with

²²⁸ See *infra* Figure 1; see discussion *infra* Parts II.A.1, 2.

²²⁹ Mann, for instance, documents how there is tacit agreement in the software industry in the United States that enables firms to access each other’s IP without the threat of litigation. See Mann, *Commercializing Open Source Software*, *supra* note 16, at 10.

²³⁰ As spelt out in the Introduction, copyright and patent are already available for software in the United States. Therefore, evidence that the software industry would have flourished in the United States even without copyright or patent is very difficult to obtain. It is particularly noteworthy that, in spite of these limitations, Professors Mann and Gilson question the connection between IP protection and the software industry, which shall be discussed in this Part.

causality. Causation may be incorrectly attributed to a condition, which is in fact merely a feature of the industry (or co-incidence or outcome). The Indian data steps in here to provide another gift—a site to double-check whether a condition featured in these U.S. studies is merely a coincidental attribute or causal factor for industry to thrive. In sum, the analysis in this Part will provide American legal scholarship with a vital contribution: it will prevent scholars from disproving IP causation on the one hand, and, on the other, from substituting it with another equally incorrect causal theory (or second-order errors).

Ronald Mann's and Ronald Gilson's studies, which employ contrasting methodologies, both contribute to a richer analysis in this Part. Ronald Mann's empirical study focuses on whether venture capitalists in the industry depend upon copyright or patent protections in making investment decisions.²³¹ Ronald Gilson, in contrast, opts for a comparative-experimental examination of which laws enabled the software industry to mushroom in the Silicon Valley yet atrophy in Massachusetts.²³² The Indian data support the following findings made by the Mann and Gilson studies on the software industry. (a) The industry does not rely on formal IP rights. (b) Instead, industry depends upon know-how or tacit knowledge, which are the skills and expertise employees acquire through experience rather than codifiable information.²³³ The comparative data enables us to check for false causation when we propose alternate causal stories (or second-order errors).

In place of IP laws, Mann and Gilson argue for alternate causal theories to explain the growth of the software industry. The data, however, dispute the alternative causal stories that Mann and Gilson provide. Mann argues copyright is important in two scenarios: (a) to prevent piracy from later-stage firms and (b) to prevent "theft" by outgoing employees. On that basis, he argues that, overall, copyright is vital for the industry.²³⁴ The data from leading software firms in the well-developed Indian industry rebuts this conclusion. As part of their standard business contracts, the top Indian software firms assign full IP rights to U.S. clients. Clearly, the large Indian software firms have surpassed the initial, start-up phases and can be characterized as later-

²³¹ Mann, *Commercializing Open Source Software*, *supra* note 16, at 1–4.

²³² Gilson, *High Technology Districts*, *supra* note 37, at 575–78.

²³³ *Id.* at 577 n.10. Gilson defines tacit knowledge in this manner. I retain this definition for this Article, which provides the necessary definitional agreement for the analysis. Mann also relies on a similar definition—tacit knowledge is knowledge "which is difficult to verify or transfer." Mann, *Financing*, *supra* note 18, at 992.

²³⁴ *Id.* at 1012.

stage firms. If IP is vital for later-stage firms to develop further, then why would Indian firms be willing to assign all IP rights? This practice of assigning IP rights to the clients weakens the contention that IP is important for later-stage firms to develop further.²³⁵ Moreover, the Indian data indicate software firms have created conditions that are most conducive to free migration of personnel between firms.²³⁶ No copyright infringement action has been brought against any ex-employee, and there is no concern over “theft” by outgoing employees.²³⁷ The evidence contradicts any suggestion that software firms use copyright to police departing employees and their activity.

Gilson, in contrast, pinpoints causation in a California statute because the software industry flourishes in California’s Silicon Valley as opposed to Massachusetts’s Route 128 region.²³⁸ Gilson attributes Silicon Valley’s success to California law, which does not enforce post-employment covenants not to compete.²³⁹ However, the Indian data do not support the conclusion that this California law is a causal determinant of where industry flourishes. India displays near-identical geographical concentration and development. As in the Silicon Valley-Route 128 saga, Bangalore raced past Mumbai, where the industry first started.²⁴⁰ But

²³⁵ See *infra* Conclusion.

²³⁶ *Id.* (discussing how software firms reimburse new hires for payments in lieu of notice period paid to ex-employers. This suggests industry values transfer of know-how through employee mobility rather than formal IP.).

²³⁷ See, e.g., Mann, *Financing*, *supra* note 18, at 1018.

²³⁸ Gilson, *High Technology Districts*, *supra* note 37, at 577, 578 (choosing, as the context of his “analysis[,] the juxtaposition of two familiar U.S. high technology industrial districts: Silicon Valley on the San Francisco peninsula and Route 128 outside of Boston” to tap into Annalee Saxenian’s study and benefit from the “natural experiment to test competing explanations for the two districts’ differential performance.”).

²³⁹ *Id.* at 578. The American software industry appears to be spatially concentrated in specific areas, referred to as “industrial districts” or “geographic concentration.” Firms benefit from “agglomeration economies” or input needed for production, such as labor in this case is “available more cheaply within the region because of the spatial concentration of users. Marshall used the labor market as an example of the increasing returns phenomenon. As more firms in an industry locate in a region, workers with the skills demanded by the industry follow. The process is self-reinforcing: as more skilled workers locate in a region, other firms in the industry follow. The geographic concentration of firms result in a lower cost of skilled labor.” *Id.* at 576 (citations omitted). See also *id.* for a discussion on geographical clustering, which results in industrial districts and high technology districts in particular.

²⁴⁰ Mumbai had an enormous head start and was the largest software producer in India in the 1960s. In fact, Tata Consultancy Services (TCS) was established at the Santa Cruz Electronics Export Processing Zone in Mumbai in 1968. TCS

there are no differences in the law of the two industrial districts in India with regard to the legal protection of postemployment covenants. Both districts are governed by the same federal law in India. Section 27 of the Indian Contract Act of 1872 renders post-employment covenants not to compete void.²⁴¹ The geographical spread of the industry in India

had a huge advantage as it was a part of the Tata Group, which was India's largest firm and accounted for 2.7 percent of the national GDP in 2007. Mumbai has, however, receded as the hub of India's software industry. Bangalore and other southern cities entered the software industry well after Mumbai, but have displaced Mumbai, which is now ranked seventh. Today, Bangalore not only accounts for over one-third of India's software industry and software exports, but TCS and other Mumbai firms have relocated significant operations and offices to Bangalore. For more details about Bangalore's software industry, see *infra* Conclusion. See also SAXENIAN, *THE NEW ARGONAUTS*, *supra* note 122, at 277–78 for the origins of the Indian software industry, the establishment of TCS in Mumbai, and general industry history; Soutik Biswas, *Tata – Integral Part of Indian Life*, BBC NEWS, (Jan. 31, 2007, 12:11 PM), http://news.bbc.co.uk/2/hi/south_asia/6316275.stm; *Information Technology in India: Top 10 IT Hubs in India*, WIKIPEDIA, http://en.wikipedia.org/wiki/Information_technology_in_India_-_Top_Eight_IT_Hubs_in_India (last visited Apr. 14, 2011).

²⁴¹ The Indian Contract Act, 1872 (“27. *Agreement in restraint of trade void*. Every agreement by which anyone is restrained from exercising a lawful profession, trade or business of any kind, is to that extent void. Exception 1. Saving of agreement not to carry on business of which goodwill is sold. - One who sells the goodwill of a business may agree with the buyer to refrain from carrying on a similar business, within specified local limits, so long as the buyer, or any person deriving title to the goodwill from him, carries on a like business therein: Provided that such limits appear to the court reasonable, regard being had to the nature of the business.”). The Supreme Court of India disfavors post-employment covenants not to compete, and consistently upholds any restrictions after the term of contract as a “restraint of trade” that is void, and provides strict construction of the exception provided by the proviso to Sec. 27. See *e.g.*, *Percept D’ Mark (India) (P) Ltd. v. Zaheer Khan* (2006) 4 SCC 227, ¶ 56 (“The legal position with regard to post-contractual covenants or restrictions has been consistent, unchanging and completely settled in our country,” citing the 132-years-old interpretation laid down in *Madhup Chander v. Rajcoomar Doss*, (1874) 14 Beng LR 76). See also *id.* at ¶ 63 (“[U]nder Section 27 of the Contract Act: (a) a restrictive covenant extending beyond the term of the contract is void and not enforceable, (b) the doctrine of restraint of trade does not apply during the continuance of the contract for employment and it applies only when the contract comes to an end, (c) as held by this court in *Gujarat Bottling v. Coca-Cola* this doctrine is not confined only to contracts of employment, but is also applicable to all other contracts.”). Article 141 of the Indian Constitution provides that the decisions of the Supreme Court are binding precedent on all other Indian courts. INDIA CONST. art. 141. This law, therefore, is uniformly applied throughout India, with no inter-state differences. See *e.g.*, *Jet Airways (I) Ltd. v. Jan Peter Ravi Karnik*, MANU/MH/0434/2000, where the High Court

unrelated to the legal protection provided by postemployment covenants runs counter to Gilson’s causal story.

Parts III.A and III.B below will discuss the Mann and Gilson studies and how the facts and figures from India ensure scholars do not get trapped in false causation or commit second-order errors. In other words, we do not disprove the connection between IP protection and software industry growth only to then fall prey to second-order errors of attributing causation to another equally unrelated law.

A. Intellectual Property – A Non-Determinant for Investment

Ronald Mann’s empirical study on how venture capitalists make investment decisions reveals that venture capitalists place little or no reliance on copyright or patent protection when making those decisions.²⁴² Mann’s study affirms that, if they are considered at all, IP rights are of very low priority in determining a venture capitalist’s investment decision.²⁴³ The Indian software industry supports and supplements these findings.

First, as explained in Part II, the data from India show IP is far less important for industry to prosper than previously surmised.

of Bombay refused to enforce postemployment restrictions. (In this case, airline employment contracts prevented pilots who had received assisted training from taking up employment with competitors. This was struck down as void on the basis that Indian law does not permit any negative covenants in the post contract period.). *See id.* ¶ 7. No software firm has filed any suit so far in any court in India to enforce any postemployment covenants. Given the law, and the courts’ view in many industries and services including airlines, it is extremely unlikely that the courts will view the software industry differently (and be willing to carve out any additional exception to the statute merely for one industry). IT should be noted that this decision is by the High Court of Bombay (or Mumbai, where the Indian software industry first germinated, which is compared to Route 128 in the United States in this Article).

²⁴² Mann, *Financing*, *supra* note 18, at 976. Mann’s study demonstrates patents alone do not factor into the decision to invest. Instead, if patents are considered, they are viewed as a signal for the uniqueness and market potential of the products.

²⁴³ *Id.* at 980–81 (citation omitted). Mann’s study avers venture capitalists attach far more importance to other factors in making investment decisions. *Id.* at 976, 980–81 (citation omitted). Investors focused on “sustainable differentiation,” and examined various attributes of the company as indirect predictors for its success. Different investors had differing views on patents. Overall, there was mixed reliance on patents. In the limited situations when venture capitalists do rely on patents, “[t]he most likely explanation is that investors are simply implementing different investment models based on their particular expertise. *Id.* at 976–78. Therefore, the overall finding remained unchanged. For a discussion on foreign investment in Bangalore, see Lateef, *supra* note 132, ch. 4.

According to standard law and economics views of property, scholars would expect that IP's monopoly grant enables the technology firm to attract investment.²⁴⁴ Mann's study reflects different results on the ground. When deciding in which of a small number of firms she should invest (usually about 6 out of 1,000), a venture capitalist focuses on "the firm's competency to execute its concept successfully" or market experience and management's skills.²⁴⁵ The venture capitalist cares about the firm's "sustainable differentiation," or whether the firm can do something its competitors cannot achieve in the future.²⁴⁶ With regard to IP, Mann's analysis reveals (a) "IP protection is important only indirectly"²⁴⁷ and (b) investors do not universally value IP.²⁴⁸ Various investors weigh in on IP protection differently, which Mann hypothesizes is the result of investors "implementing different investment models based on their particular expertise."²⁴⁹ The point remains that IP rights count for far less with investors than assumed earlier. (c) Even among the investors who look for IP protection, they are more interested in the "technology that is sufficiently cutting edge to warrant protection."²⁵⁰

Second, reading the Indian information in conjunction with Mann's findings helps resolve the law and economics theory *in toto*. Law and economics scholars argue property rights will result in growth, and a more recent strain in scholarship posits property rights are necessary to encourage investment. Mann's data from the United States clearly dispute the latter prong,²⁵¹ and the Indian industry disproves the former prong.²⁵² The Indian industry data supplements Mann's analysis here.

²⁴⁴ Mann, *Financing*, *supra* note 18, at 975.

²⁴⁵ *Id.* at 975–76.

²⁴⁶ *Id.* at 976.

²⁴⁷ *Id.* Investors care most about the expectation of market power, and ownership of IP is valued only as one of the many attributes that may indirectly predict market power.

²⁴⁸ *Id.* at 977–78 (discussing investors' varying attitudes toward IP protection).

²⁴⁹ *Id.* at 978.

²⁵⁰ *Id.* at 977.

²⁵¹ Mann's study demonstrates venture capitalists do not place much importance on IP rights, from which one might extrapolate investors *generally*, not just venture capitalists, do not place much weight on IP protection because "most important innovations in the software industry come from relatively small firms," which "typically are venture backed." *Id.* at 973 (citation omitted). Ronald Mann and Thomas Sager's empirical study on venture capital investment in the software industry provides additional corroboration. See Ronald J. Mann & Thomas W. Sager, *Patents, Venture Capital, and Software Start-ups*, 36 RES. POL'Y 193, 194 (2007) ("Patent acquisition (or application) at the time of initial investment is largely irrelevant to the firm's subsequent progress through the venture capital cycle, measured by any metric."). The paper acknowledges,

Third, the Indian industry’s actual business contracts reflect Mann’s intuition. Mann suggests tacit knowledge may be far more valuable for software firms than previously surmised (and IP law’s main benefit for industry may be in codifying this tacit knowledge).²⁵³ The conduct of Indian software firms affirms Mann’s assertion, and the business contracts go a step further. The business contracts that Indian firms enter into with clients in the United States (and elsewhere) show, on the one hand, the Indian firm has no qualms in transferring full IP rights to the client while, on the other, it protects against transfer of know-how by not permitting employee hiring.²⁵⁴ In the contract with the client, the Indian firm insists on including a clause imposing a penalty or a punitive damages amount if a client hires away the Indian firm’s employees.²⁵⁵ Indian firms thus avoid transfer of know-how or tacit knowledge, signaling what truly matters to the firm.

The Indian industry data supplements Mann’s study but refutes Mann’s conclusion. In spite of the novel data that Mann unearths, dissolving IP-software causation, Mann concludes “copyright plays a crucial role in the industry’s ability to appropriate returns from the innovation it produces.”²⁵⁶ He bases his conclusion on two reasons. Although IP protection does not encourage investment, it fulfills two narrow purposes: (a) preventing piracy—it is easier to prove copyright infringement rather than patent infringement because copyright has a lower standard of originality than the high standard required to establish patentability,²⁵⁷ and (b) preventing code theft by departing employees—

however, that there may be situations in which IP is relevant: (a) later stages of development post-venture capital financing, and (b) in certain types of software development. *Id.* at 194, 199. Still, Mann and Sager’s study does not detract from the overall point of this Article—that evidence from the Indian software industry does not support the automatic presumption that growth requires stronger IP protection.

²⁵² See *supra* Part II.

²⁵³ See Mann, *Financing*, *supra* note 18, at 992.

²⁵⁴ See Interview with Management, *supra* note 112.

²⁵⁵ *Id.* For a discussion on how Indian firms persuade U.S. firms to agree to this term, see the discussion of an “arm’s distance” agreement, *infra* note 290.

²⁵⁶ Mann, *Financing*, *supra* note 18, at 1015.

²⁵⁷ *Id.* at 1017 (“For example, even if pirated software is protected in part by a patent, a suit against the pirate challenging patent infringement necessarily is more difficult because of the need for the software owner to establish the patent’s validity. Because of the relatively high standard of patentability—compared to the copyright standard of originality—it always will be difficult for the patent owner to get over the threshold of patentability. Because of the low threshold of copyrightability, it never will be difficult for the owner of copyrighted software to establish that the software includes copyrightable innovation.”). Mann also defends copyright on the basis that “[s]tatistics from

because of the litigation costs and uncertainty associated with patent litigation, firms find it easier to utilize copyright infringement claims rather than patent claims in order to prevent employees from reusing a substantial portion of code produced while at their previous firms.²⁵⁸

There are intrinsic defects in Mann's argument—both prongs are based on defects in the patent system, the goals of which differ from those of copyright. With regard to the “preventing piracy” rationale Mann puts forward, higher standards of patentability are features of the patent system, which cannot be the basis to justify copyright.²⁵⁹ With regard to the “code theft” argument, again, the purpose of copyright is not to correct any problem in patent enforcement. Simply stated, the Framers of the Constitution did not intend Congress to legislate on copyright with the purpose of plugging gaps in patent systems.²⁶⁰ Still, scholars would require extrinsic proof that copyright does not support industry in other ways (similar to the confirmation we needed to curtail copyright's expansions).

The analysis of Indian industry in Part II comes to the rescue here. The comparative study dissolved the presumption that industry needs IP rights to flourish, and distinguished causal from coincidental factors in the U.S. software industry. Mann identifies a few

the Department of Justice suggest that the federal government often sues pirates for criminal copyright infringement; there is not a statute for criminal patent infringement.” *Id.* As noted earlier, these are system characteristics, which may arguably make the case for internal reform but not a deontic justification for copyright. This objection eliminates any remaining argument that seeks to justify copyright on the basis that it fills gaps in patent law.

²⁵⁸ *Id.* at 1018.

²⁵⁹ Mann alludes to this idea to some extent when he admits these characteristics are “structural.” *Id.* at 1015. They are features of the patent system rather than copyright justifications. Moreover, there are internal inconsistencies in the piracy justification. On the one hand, Mann argues that copyright is the only effective protection against piracy, but on the other, he documents piracy losses, particularly in the consumer software sector, and the enterprise software sector in other countries. He even relies on studies that document a piracy rate of over 22% in consumer software in the United States, suggesting copyright protection is not an effective means of preventing piracy. Furthermore, it does not provide any justification for copyright protection in the first place. *See id.* at 1015–17.

²⁶⁰ *See supra* Part I.A for a brief synopsis of the goals the Framers of the Constitution intended to achieve. It is also questionable whether we would like copyright to be deployed to resolve issues with departing employees. Mann distinguishes the piracy problem from the departing employees problem in part by emphasizing the actors in the piracy problem are consumers rather than employees or other software companies, which in turn raises other concerns. I thank the editors of this Journal for pointing out this distinction.

circumstances in which patents are useful for firms.²⁶¹ Given that copyright and patent protections are available for software in the United States, it is unsurprising that firms or investors *occasionally* rely on them (or some firms pursue a business strategy that is based upon IP rights). Still, to base causation on the fact that a small number of firms do file for patents or copyright and argue for wide property protection is a stretch. Without the comparative information, we are unable to truly decide whether or not industry is prospering because of these benefits.²⁶² This comparative study helps prevent imputing causation to IP because it already exists (or is a “historic outcome”).

B. The Value of Know-How

Ronald Gilson constructs an elegant hypothesis based on observations of U.S. industry, particularly the relative ascendance of Silicon Valley (over Route 128 in Massachusetts). He uses Annalee Saxenian’s experimental study, which uncovered that, although Massachusetts’s Route 128 initially led California’s Silicon Valley, Silicon Valley eventually overtook Route 128 in productivity.²⁶³ Gilson theorizes the law enabling free transfer of employees between firms is the reason Silicon Valley continues to thrive; also, it is the causal condition for a software industry to succeed.²⁶⁴ Gilson’s theory appears plausible, but is easy to deny absent supporting evidence.

India’s software industry steps in to bridge this gap, and provides an apt site to test Gilson’s thesis, particularly because India’s software industry too developed along industrial district lines. Like the geographical clustering in Silicon Valley, the industry in India is

²⁶¹ Mann argues, as a general rule, pre-revenue startups find it difficult to obtain any value from patents. In fact, obtaining patents often diverts the firm’s focus from successfully building the product and business. If, however, firms survive that phase and become larger, some indirect benefits such as information gains emerge. Mann, *Financing*, *supra* note 18, at 961–62.

²⁶² *Id.* at 962. (“The central question, which I do not attempt to answer here, is whether those benefits are sufficiently substantial to justify the costs of obtaining the patents.”).

²⁶³ Gilson, *High Technology Districts*, *supra* note 37, at 577–78. Saxenian is content to attribute Silicon Valley’s success to the differences in “business culture” between the two regions. Gilson, however, argues that the legal infrastructure created the business culture in California *in the first place* and that the legal infrastructure is therefore the root cause of Silicon Valley’s continued success.

²⁶⁴ Gilson makes this argument in the context of “high technology districts.” I use “software industry” instead in this Article. For easy reading, I have opted for uniformity and this substitution does not affect our analysis.

concentrated in Bangalore.²⁶⁵ Moreover, a central part of Gilson's thesis is built on Silicon Valley's history of surging ahead of Route 128.²⁶⁶ Here too, the industrial districts in India mirror those in the United States and were involved in a near-identical race. The industrial district Bangalore surged ahead of Mumbai even though Mumbai (like Route 128) was the original leader in software exports in the 1960s. For these reasons, India offers a particularly appropriate site to test and gather proof for Gilson's elegant theory, if it is correct.

The Indian evidence verifies and proves Gilson's analysis, and simultaneously disproves the conclusion. First, based on the comparative study of Silicon Valley and Massachusetts, Gilson disproves IP as the causal explanation for industry growth. "[T]he success of Silicon Valley firms suggests that per capita firm value will be greater where intellectual property protection is somewhat diluted, in contrast to the traditional law and economics prescription that emphasizes full protection of intellectual property."²⁶⁷ IP is governed by U.S. federal law,

²⁶⁵ Bangalore's industrial district alone accounts for one third of India's total software industry and the highest software exports from India. Wipro and Infosys, the second and third largest Indian software firms are headquartered in Bangalore. Many top U.S. and other international software firms (such as Google, IBM, Yahoo!, Oracle Corporation, and others), as well as other Indian software firms (TCS, iGate, and others), maintain significant offices in Bangalore. In less than two decades, Bangalore was transformed from a pensioner's paradise into the software industry hub. In 1992, the first information technology park was set up in Bangalore, and the U.S.-based Texas Instruments set up the first "offshore" software production and laid the physical cables for the Internet. The software industry quickly germinated and built on the prior presence of the electronics park, known as the Karnataka State Electronics Department, which was established in 1976. Bangalore's three clusters, the Software Technology parks of India, International Tech Park, and Electronics City now account for the vast majority of India's software output. See James Heitzmann, *Becoming Silicon Valley*, 503 SEMINAR (2001), available at http://www.india-seminar.com/2001/503/503_james_heitzman.htm (last visited Nov. 18, 2011).

²⁶⁶ See Gilson, *High Technology Districts*, *supra* note 37, at 586–87 (providing economic data measuring how, in 1965, Route 128 started well ahead and employed nearly three times the number that Silicon Valley did. But by 1994, Silicon Valley had surged ahead of Route 128, creating new employment several times over and emerging as the top software-exporting district. Meanwhile, Route 128 dropped out of the top five software-exporting districts in the United States.).

²⁶⁷ *Id.* at 575. For a detailed discussion, see *id.* at 620–26. Note that Gilson does not argue where industry will first be set up, but rather which industrial districts will continue to develop and be sustainable in the long term. He argues that less IP protection is critical for long-term success of the district's development. This

and both California and Massachusetts share the same initial conditions for establishing the industry. IP law, however, fails to explain why Silicon Valley surged ahead, while Route 128 deteriorated. The natural experiment in India supports and corroborates Gilson’s thesis²⁶⁸—Indian firms’ growth was independent of IP laws.²⁶⁹ They did not seek IP protection in India or abroad and have no qualms about transferring full IP rights to clients.²⁷⁰ Formal IP rights are not as central for the software industry to thrive as imagined.

Second, for a software industry to endure in any industrial district, free inter-firm transfer of know-how or “tacit knowledge”²⁷¹ is needed. Gilson (using Saxenian’s study) argues that in Silicon Valley (unlike in Massachusetts), engineers and other employees constantly shifted between firms. When employees moved, they carried the employer’s know-how with them to the new firm, and created “knowledge spillovers.”²⁷² Knowledge spillovers in turn were critical in resetting an industrial district’s production life cycle.²⁷³ In short, “knowledge spillovers facilitated by the mobility of employees . . . turn the entire industrial district into an engine of continuous innovation, thereby transcending the life cycle of any single product.”²⁷⁴ Route 128, in contrast, had no such culture of job-hopping and employee mobility. Gilson explains why knowledge spillovers are important for the software industry to succeed in the long term. (a) High technology industrial districts such as Silicon Valley and Route 128 follow a cyclical

argument does not affect the central thesis of this Article, but is included here for completeness. Also, Gilson clearly knocks out “intellectual property” as a causal factor as discussed. In doing so, he takes the much harder path of establishing how “tacit knowledge,” or how to implement the data rather than the codifiable information, is the critical linchpin.

²⁶⁸ Gilson does look for empirical proof supporting his thesis that IP is not so central, or “causal empiricism” as he calls it. As explained earlier, such evidence of “IP without IP” cannot be gathered in the United States since it already provides IP cover for software. But in order to support his thesis, Gilson produces one example—if firms needed full IP protection, then Novartis would not have set up its new research center in California, whose enabling knowledge spillover dilutes IP, according to Gilson. *Id.* at 622. Instead of requiring us to deduce a conclusion on the basis of one example or the counterfactual, the Indian industry comes to Gilson’s assistance and provides clear experimental proof.

²⁶⁹ See *supra* Part II.

²⁷⁰ *Id.*

²⁷¹ See *supra* Part III.

²⁷² Gilson, *High Technology Districts*, *supra* note 37, at 585.

²⁷³ *Id.* at 591.

²⁷⁴ *Id.*

development path.²⁷⁵ (b) Once a product matures, the advantage in clustering around knowledge centers vanishes and the district diffuses, which is what happened with Route 128.²⁷⁶ (c) A district will, however, continue to innovate and become self-sustaining as Silicon Valley did, if it is able to develop “new products that will reset the industry life cycle.”²⁷⁷

Gilson’s argument in favor of spillovers requires proof, especially because it militates against the prevailing law and economics prescription for more property protection. Bangalore provides evidence that confirms Gilson’s intuition and reveals an industry business practice that enhances employee movement even more than the trends unearthed in Silicon Valley. As in Silicon Valley, the software engineers and employees in Bangalore freely switch between firms and may even work for former competitors. The region is characterized by “high velocity employment,” as Professor Alan Hyde terms it.²⁷⁸ Interestingly, Indian software firms reimburse new hires for any payment they may have made in lieu of providing the proper notice period to their prior employers.²⁷⁹ This hiring practice by firms vastly enhances inter-firm movement and is a step over and above the “culture of mobility” Saxenian documents in Silicon Valley.²⁸⁰ In other words, if Silicon Valley “allows” employee movement, Bangalore actively “enables” employee movement.

Third, the “legal rules governing employee mobility” are the causal antecedent for creating cultures that supported free inter-firm knowledge transfer, which led to Silicon Valley’s success.²⁸¹ In particular, Gilson attributes Silicon Valley’s continued success to California’s Business and Professions Code Section 16600, which disallows post-employment covenants not to compete.²⁸² In short, based

²⁷⁵ *Id.* at 585.

²⁷⁶ *Id.*

²⁷⁷ *Id.*

²⁷⁸ *Id.* at 591.

²⁷⁹ See Interview with Management, *supra* note 112. This “buying-out the old employment contract” practice used to be an extremely common, almost standard, industry-wide practice in India. Since the 2008 global financial crisis, it has become less common. Firms now ask that new hires negotiate out of their notice period with past employers. But the practice continues, even if in somewhat reduced numbers. Notably, the senior manager of a top-five software firm in India indicated this practice continues when the firm wants the new hire to work on a project that is set to commence immediately.

²⁸⁰ SAXENIAN, REGIONAL ADVANTAGE, *supra* note 36, at 111–17. See also Gilson, *High Technology Districts*, *supra* note 37, at 578.

²⁸¹ *Id.* at 578.

²⁸² *Id.* at 607–609.

on the relative performance of Silicon Valley, Gilson locates causation in a California state law. The business agreements of software firms in India validate Gilson’s analysis that industry values free inter-firm knowledge transfer, particularly of tacit knowledge. But it discredits the conclusion that the state law on post-employment restrictions is responsible for the industry’s long-term success.

As discussed earlier, the industry in India closely mirrors the U.S. industry in two respects. First, the formation of industrial districts in India closely resembles that in the United States. This clustering in both the U.S. and India suggests agglomeration may be an industry trait.²⁸³ Second, one industrial district in India, Bangalore, surged ahead of Mumbai even though Mumbai was the leader in software exports in the 1960s (just like Silicon Valley superseded Route 128).²⁸⁴ However, there is no difference in the law on point—Bangalore and Mumbai share the same law with regard to post-employment restrictions.²⁸⁵ This observation disputes Gilson’s conclusion that the law on post-

²⁸³ See Arora & Gambardella, *supra* note 134 (drawing interesting parallels with similar clustering in other industries like tire manufacturing).

²⁸⁴ See *supra* note 266 and accompanying text.

²⁸⁵ As a general rule, postemployment restrictions are not enforceable in India. Moreover, Indian courts do not view postemployment covenants favorably, other than in exceptional circumstances. Even here, the courts interpret restrictions narrowly. For the legal provision that renders postemployment covenants illegal and the case law, see *supra* note 241. The law on point is well established by the Supreme Court of India, equally binding on all courts and is applied nationwide. Because of the structure of the courts in India, the decisions have a wider and uniform reach. Even though India, like the United States, is a federation with separate executive and legislative bodies at the state and federal level, there is a unitary court system. The high courts of each state report to the Supreme Court of India. In other words, India does not separate its courts into federal and state courts. With regard to software, the industry in Bangalore raced ahead of its Mumbai counterpart, even though both districts treated postemployment restrictions identically. Several alternate reasons have been articulated to explain why Bangalore emerged as the center of the software industry in India, especially as Bangalore’s meteoric rise was propelled by software rather than traditional industry. These reasons range from the existence of the closely related electronics sector to forward and backward linkages with aeronautics and defense sensitive industries in Bangalore because Bangalore was strategically placed away from the borders. Similarly, the emergence of the industry in south India was attributed to the higher number of engineering colleges, the English-speaking workforce, and others such reasons. See Lateef, *supra* note 132, chs. 2, 4, 5. A complete analysis of Bangalore is beyond the scope of this Article. For the purpose of this Article, it is sufficient to demonstrate that the software industry in India displays near identical geographical agglomeration as the industry in the United States.

employment restrictions is the primary factor in the growth of the software industry. The Indian data suggests post-employment restrictions may perhaps be a necessary factor but is not sufficient to determine industry longevity. Sorting through various factors and identifying the precise factors for the industry's success in Bangalore is left for future work. In the present Article, fostering an understanding of Indian industry data ensures that scholars will not fall prey to false causation. It prevents the substitution of one causal story (IP in this case) with another law (post-employment restrictions), which is equally incorrect.

Another aspect Gilson touches upon in passing is how tacit knowledge or know-how is more valuable to the industry than formal information, which IP law seeks to protect. Earlier, firms in knowledge-based industries preferred proximity in space (or geographic proximity) to benefit from the associated economies.²⁸⁶ But with the Internet enabling instantaneous communication, the need for physical proximity has been dissolved.²⁸⁷ “From this perspective, the effect of technology should be to eliminate” geographical clustering.²⁸⁸ Instead, the software industry displays the opposite behavior and Gilson explains this contradiction. “The puzzle disappears when one distinguishes between information on the one hand and knowledge or know-how on the other. The distinction is in the tacit character of knowledge—not the formal conception of an innovation, but the skill and experience associated with effectively creating, developing, and implementing it.”²⁸⁹ Business agreements entered into by Indian software firms with U.S. clients reveal surprising proof supporting Gilson's intuition. In contracts with clients in the United States and elsewhere, Indian firms specify the client cannot hire the Indian firm's employees.²⁹⁰ Indian firms insist upon this

²⁸⁶ For a discussion on knowledge yielding increasing returns as a result of geographic proximity, see Gilson, *High Technology Districts*, *supra* note 37, at 581–82.

²⁸⁷ *Id.* at 582 (“Precisely because of high technology, information has lost its geographic anchor. For example, the physical location of a law library is unimportant when the case reports are available electronically through Lexis and Westlaw.”).

²⁸⁸ Gilson in fact argues “[t]he more important knowledge is as an input, the less likely we should be to observe industrial clustering.” *Id.*

²⁸⁹ *Id.* (“Although advances in information technology may have caused the cost of transmitting the formal conception to become invariant to distance, effectively transmitted tacit knowledge requires proximity, and hence, creates the potential for agglomeration economies.”).

²⁹⁰ A senior management official of a top Indian software firm called it an “arm's distance” agreement. In other words, Indian firms offer a two-way clause whereby the U.S. client and Indian firm agree not to poach each other's staff. During negotiations, the clause is explained as providing gains to the U.S. firm

contractual term, and to discourage such hiring-away, they impose a punitive damage penalty if any client defaults on this covenant.²⁹¹ The Indian firm, however, has no qualms about assigning formal IP rights to the client.²⁹² The business contracts thus speak volumes on what the Indian software firms prize most.

Interestingly, the Indian data hits the precise sweet spot to which Gilson alludes. Gilson argues the only two ways in which this valuable knowledge transfer can occur are either through a market relationship (transmission of technological know-how by contract with a supplier) or through the movement of workers between employers.²⁹³ Both these prongs are animated in Indian software firms—they restrict the transfer of tacit knowledge via a market relationship (i.e., by prohibiting the hiring of employees from the Indian firm or its supplier).

The analysis here suggests tacit knowledge or know-how is far more important for the software industry than the formal information that is codified and protected under copyright or patent law. The inquiry in this Part, along with that in Part II (which established how the industry does not rely on IP protection), provides a more textured understanding of the software industry and the nature of knowledge that drives innovation.

CONCLUSION: A CAUSAL EXPLANATION BEYOND “HISTORIC ACCIDENT”

We witness a battle on the technology front as Apple and Samsung sue each other for IP infringement in a bid for market

and prevents any conflicts in the future. For instance, if the Indian firm were to hire the U.S. client’s employees, it would gain valuable financial and business information that would give it an advantage in future negotiations and also create fears. Including this clause provides both firms with the confidence necessary to collaborate and work together on the current project. He further clarifies that occasions of such U.S. firms poaching the Indian firm’s employee is rare. Moreover, in the rare instance this condition has been breached, the Indian firm has preferred to “forgive” the U.S. firm (forgoing the penalty amount), in light of the size of the business from the U.S. client. The management officer emphasized that this condition has rarely been violated. Interview with Management, *supra* note 112. Note that this quote echoes the intuition and finding that Gilson, Sabel & Scott note as braiding—the intertwining of formal and informal contracting practices that enable cooperation in the innovation industries. *See* Gilson, Sabel & Scott, *supra* note 42.

²⁹¹ *Id.*

²⁹² *Id.*

²⁹³ *Id.* at 582–83.

control.²⁹⁴ On the one hand, this litigation is a fight between open and proprietary software models, which goes to the heart of our debate over the belief that the future of digital technology depends upon our ability to rein in expansive copyright and IP law. Even though the core allegation is that Samsung has “slavishly copied” Apple,²⁹⁵ Apple is suing for patent and trademark violations, and not copyright infringement.²⁹⁶ Using this strategy further supports the argument that industry relies very little on copyright.

Data proving industry progress is not dependent on IP law are acutely needed. This Article addresses this critical gap and makes three significant contributions. First, the evidence that progress in the software industry does not depend upon IP protection provides proof that information products will be produced even without IP protection. This evidence of “IP without IP” from commercial industry relieves scholars of any inquiry into the moral motivations of programmers, which had stymied other studies in the past. For the first time, the requisite evidence to limit expansive copyright is available.

Second, the comparative analysis provides policy-makers three different data points that confirm industry values know-how rather than formal IP rights. (a) Mann’s survey of venture capitalists, (b) Gilson’s

²⁹⁴ On the one hand, open software is at the heart of this battle because the type of platform is the primary difference between Apple’s iPad (and iPhone) and Samsung’s Galaxy Tab series. Apple’s iPad and iPhone are based on a closed system model, proprietary software that severely limits users’ flexibility. In contrast, an open source operating system (i.e., Google’s Android) powers Samsung’s Galaxy Tab series, which is now challenging Apple’s dominance in the smartphone market. But this battle for markets is on the other hand being waged using IP infringement actions. In response to Samsung’s market challenge, Apple has alleged that Samsung’s Tab violates its IP and has filed suit in the United States. Samsung has countersued in Germany and Korea, and the German court granted a preliminary injunction preventing Samsung from selling its tablet in Europe. See Iwatani Kane Yukari & Ian Sherr, *Apple: Samsung Copied Design*, WALL ST. J. (Apr. 19, 2011), <http://online.wsj.com/article/SB10001424052748703916004576271210109389154.html> (discussing Apple’s 38-page suit against Samsung for “slavishly copying” Apple’s iPhone and iPad in the U.S. District Court of Northern California in April 2011); Ian Sherr, *Apple Blocks Samsung Tablet in Most of EU*, WALL ST. J. (Aug. 10, 2011), <http://online.wsj.com/article/SB10001424053111904140604576498403502419670.html>; Philipp Grontzki, *Samsung to Appeal Ban on Galaxy Tablet*, WALL ST. J. (Aug. 15, 2011), <http://online.wsj.com/article/SB10001424053111903918104576503703550686190.html>.

²⁹⁵ Matt Warman, *Apple sues Samsung for ‘slavish’ copying of iPhone and iPad*, TELEGRAPH (Apr. 19, 2011), <http://www.telegraph.co.uk/technology/apple/8460300/Apple-sues-Samsung-for-slavish-copying-of-iPhone-and-iPad.html>.

²⁹⁶ *Id.*

comparative study of Silicon Valley and Route 128, and (c) Indian software firms’ indifference to IP laws but determination to protect know-how (through restrictions on employee movement), all clearly point to one conclusion: tacit knowledge—the skill and experience associated with creating, developing, and implementing an innovation—rather than the formal conception is vital for industry.²⁹⁷

Third, this initial foray raises the interesting possibility of checking for false causation and proceeding toward an actual causal explanation for why the software industry flourishes where it does. Scholars have been compelled to rely on “serendipity” or “historic accident” as the root cause of software industry growth. For instance, as Gilson explains, the California law barring covenants not to compete was the “causal antecedent” for knowledge spillovers and the software industry growth in Silicon Valley. This law, in turn, was serendipitously passed many years ago; it was a “historical accident.”²⁹⁸ The data from Indian industry confirms Gilson’s thesis that knowledge spillovers are essential but checks the conclusion that a “law” (involving post-employment restrictions in this case) is the wellspring for industry.²⁹⁹ The Indian industrial district Mumbai clearly demonstrates that the law prohibiting post-employment restrictions is not a causal antecedent for the software industry to succeed in the long-term. Mumbai offered identical legal protection for employee movements, but Bangalore’s industry overtook that of Mumbai, even though the industry first took root in Mumbai. Likewise, Silicon Valley overtook and displaced Route 128, even though the latter started out well ahead. Having identified false causation, scholars can move toward a more accurate causal story for industry growth.

Gilson relies on only the “law” as the causal antecedent for the transfer of know-how. Indian data instead highlights business contracts, an additional tool firms use to create the necessary culture for free transfer of know-how. Moreover, contracting practice data—what firms bargain to keep and give away at the negotiating table—provides illuminating insights into what firms truly care about. Industry is not waiting for a law created by historical accident in order to flourish. Instead, through *contracts*, the industry is creating the legal rules it requires (in turn, to shape the necessary business culture). Indeed, within the region, the industry is contractually encouraging transfer of know-how that neutralize any prohibitions against non-compete agreements.³⁰⁰

²⁹⁷ See Gilson, *High Technology Districts*, *supra* note 37, at 582.

²⁹⁸ *Id.* at 578.

²⁹⁹ *Id.*

³⁰⁰ Industry not only allows but also directly “enables” free employee mobility to competitors in the region. See discussion on how firms encourage free

Simultaneously, through a second set of contracts with another set of parties (clients in the United States and in other regions), the same industry limits employee movement and prevents transfer of know-how. Proof that transfer of know-how via free employee movement is the causal antecedent for the industry (rather than the laws providing property protection for IP or non-compete restrictions) is corroborated by multiple data sets. This initial foray raises tantalizing questions for future work. By forbidding international clients from hiring away their employees, are software firms ensuring India's software knowledge remains undiluted? In short, are they effectively forging the infrastructure to perpetuate India's advantage as the key center for software in future?³⁰¹ Presently, proceeding beyond happenstance explanations provides policy-makers with accurate and inviting possibilities to emulate Silicon Valley and the Elephant development model.³⁰²

mobility by reimbursing new hires for any payments to past employers in lieu of notice period *supra* Part III.B.

³⁰¹ See also similar discussion on "second stage agglomeration economy" whereby firms continue to benefit from geographical cluster beyond one product cycle. Gilson, *supra* note 37, at 588.

³⁰² India's sluggish economic growth was earlier derided as the "[H]indu rate of growth." But subsequent to India's rapid economic rise, it has earned the moniker of "the Elephant," much like "the Dragon" is used to represent China. See also sources cited *supra* note 25.