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Patents as Signals of Quality in Crowdfunding

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PATENTS AS SIGNALS OF QUALITY IN CROWDFUNDING

Christopher A. Cotropia*

Patents and crowdfunding both attempt to foster early stage innovations. In theory, patents signal quality and value to attract investment and buyers and ultimately facilitate commercialization. Crowdfunding allows multiple individuals to make small contributions to finance start-up ventures. This Article reports on two related studies investigating the interaction between these two innovation tools by determining the impact of a crowdfunding campaign's patent status on the campaign's success and delivery. The first study examines 9,184 Kickstarter campaigns in patent-eligible categories to determine whether patented or patent-pending labeled projects are more likely to reach their funding goal and in turn achieve actual, on-time delivery when compared to non-patented projects. This study finds, perhaps surprisingly, that patented projects are not more likely to obtain funding compared to non-patented ones. In contrast, patent-pending projects are more successful in getting funded. The second study confirms this preference for patent-pending projects but not patented ones through a series of laboratory experiments on Amazon Mechanical Turk ("MTurk"). The MTurk results also indicate that patent-pending status, as compared to patented status, is more likely to be noticed by potential backers and an identified reason for such backers to invest and buy crowdfunded products. These results provide insight into whether patents (1) act as signals to attract funding and buyers, and (2) assist in commercialization in the crowdfunding context. These results also inform the proper focus of patent marking statutes.

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I. INTRODUCTION

There are a multitude of mechanisms to facilitate innovation and new business ventures. Patents are presumed by some to be such a mechanism—a government grant of limited exclusivity for new and nonobvious inventions.¹ This exclusivity, the theory goes, incentivizes the creation of inventions and, in turn, attracts investment and removes coordination barriers to facilitate ultimate commercialization.² Patents can provide signals to investors and buyers both of the invention’s quality and the existence of a vehicle, the patent, to gain exclusive market space.³

1. 35 U.S.C. § 271; Christopher A. Cotropia, *What Is the “Invention”?*, 53 WM. & MARY L. REV. 1855, 1871, 1892 (2012) (“[P]atent law incentivizes the creation of inventions by giving the inventor a mechanism by which she can recoup her development costs: exclusivity.”).

2. See Cotropia, *supra* note 1, at 1892–94; Mark A. Lemley, *Ex Ante Versus Ex Post Justifications for Intellectual Property*, 71 U. CHI. L. REV. 129, 130 (2004) (“One form of the new justifications argues that intellectual property protection is necessary to encourage the intellectual property owner to make some further investment in the improvement, maintenance, or commercialization of the product.”); Ted Sichelman, *Commercializing Patents*, 62 STAN. L. REV. 341, 375 (2010) (“[B]y granting broad claims early in the innovation process, the patentee could coordinate post-patenting development and commercialization efforts among several players, reducing duplicated costs and preventing competitors’ use of unpatentable information generated in the process.”); F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINN. L. REV. 697, 710 (2001) (“The patent right to exclude competitors who have not shared in bearing [the] initial costs provides incentives for the holder of the invention and the other players in [the] market to come together and incur all costs necessary to facilitate commercialization of the patented invention.”); Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265, 276 (1977) (“[T]he potential gains from exclusive ownership are particularly large. No one is likely to make significant investments searching for ways to increase the commercial value of a patent unless he has made previous arrangements with the owner of the patent. This puts the patent owner in a position to coordinate the search for technological and market enhancement of the patent’s value so that duplicative investments are not made. . . .”).

3. Clarisa Long, *Patent Signals*, 69 U. CHI. L. REV. 625, 637 (2002) (“[P]atents can serve as a signal of . . . quality. . . . If observers in capital markets believe that patents convey significant information about a firm

A more recent means to enable innovations to come to market is crowdfunding.⁴ Crowdfunding allows multiple individuals to make small contributions to fund the ultimate deployment of an innovation.⁵ Crowdfunding takes many forms, from pre-buy to actual capital investments.⁶ Even in the pre-buy crowdfunding space—where financial support for the campaign is rewarded with a commercial version of the crowdfunded innovation—supporters view themselves as “investors” in bringing a product they believe in into the market.⁷ Both patents and crowdfunding are meant to help innovations secure funding and, in turn, reach commercialization.⁸

While some have empirically studied whether either of these mechanisms help innovations reach these goals,⁹ this Article explores the interplay between the two and, in particular, whether patents assist crowdfunding campaigns in successfully signaling quality and value to potential backers. This study investigates what happens when an innovation is labeled as patented, or has patents pending, and is also the subject of a crowdfunding campaign. This Article’s study both (1) observes patents in the actual, live crowdfunding environment to determine if patented, or patent-pending, crowdfunding campaigns are more likely to obtain their funding goal and in turn achieve actual, on-time delivery as compared to non-patented projects and (2) examines the impact of varying the patent status, on the same innovation on a respondent’s willingness to buy or invest in a “mock” crowdfunding campaign.

that makes the firm a more attractive investment opportunity, firms may choose to experience losses in product markets in order to capture gains in capital markets.”).

4. Blakely C. Davis, Keith M. Hmieleski, Justin W. Webb & Joseph E. Coombs, *Funders’ Positive Affective Reactions to Entrepreneurs’ Crowdfunding Pitches: The Influence of Perceived Product Creativity and Entrepreneurial Passion*, 32 J. BUS. VENTURING 90, 90 (2017) (“[C]rowdfunding enables entrepreneurs to garner funds in support of . . . the development or distribution of a new, unfinished, or unproven product.”); Michael A. Stanko & David H. Henard, *Toward a Better Understanding of Crowdfunding, Openness and the Consequences for Innovation*, 46 RSCH. POL’Y 784, 784 (2017) (“Crowdfunding has quickly evolved into a commonly used vehicle to help innovating entrepreneurs get products developed and is one of the ways that innovative, small organizations have been able to access capital . . .”); Thomas Clauss, Robert J. Breitnecker, Sascha Kraus & Alexander Brem, *Directing the Wisdom of the Crowd: The Importance of Social Interaction Among Founders and the Crowd During Crowdfunding Campaigns*, ECON. INNOV. & NEW TECH. 709, 712 (2017) (“With crowdfunding, founders can access a market while raising external money at the same time.”).

5. Ethan Mollick, *The Dynamics of Crowdfunding: An Exploratory Study*, 29 J. BUS. VENTURING, 1, 2 (2014) (“Crowdfunding refers to the efforts by entrepreneurial individuals and groups . . . to fund their ventures by drawing on relatively small contributions from a relatively large number of individuals using the internet, without standard financial intermediaries.”); ARMIN SCHWIENBACHER & BENJAMIN LARRALDE, *HANDBOOK OF ENTREPRENEURIAL FINANCE* 4 (2010).

6. Mollick, *supra* note 5, at 1 (“Crowdfunding projects can range greatly in both goal and magnitude, from small artistic projects to entrepreneurs seeking hundreds of thousands of dollars in seed capital as an alternative to traditional venture capital investment.”); Paul Belleflamme, Thomas Lambert & Armin Schwiendacher, *Crowdfunding: Tapping the Right Crowd*, 29 J. BUS. VENTURING 585, 586 (2014) (crowdfunding allows “entrepreneurs [to] invite consumers to pre-order the product, to collect the necessary capital for launching production . . .” and also allows “entrepreneurs [to] solicit individuals to provide money in exchange for a share of future profits or equity securities”).

7. Belleflamme et al., *supra* note 6, at 589 (“In addition to earning money on their investment, participants can interact with company founders and receive updated information on the firms’ most recent developments, getting in return a feeling of belonging to a community of investors.”).

8. See Davis et al., *supra* note 4, at 90; Lemley, *supra* note 2, at 130.

9. Belleflamme et al., *supra* note 6, at 585; Mollick, *supra* note 5, at 4.

The first part of the study collects the universe of Kickstarter campaigns in the Technology category from the website's inception in 2009 to June 1, 2017. The study collects multiple attributes of the 9,184 campaigns in the dataset that had ended, including whether the campaign was successful (fully funded) and the identified patent status of the campaign (patented, patent-pending, and no patent identified). The second part is a laboratory experiment using Amazon Mechanical Turk, randomly providing subjects with an image of a "mock" Kickstarter campaign that is labeled as "patented," "patent-pending," or silent on patenting. There are two mock campaigns—headphones and flip-flops—of which 1,509 respondents answered a series of questions about, including how likely the respondents would be to invest or buy the campaign's product. Respondents were also asked whether they noticed the displayed patent status and about their general understanding and opinions on patents.

Both aspects of the study—looking at live and mock crowdfunding campaigns—find, perhaps surprisingly, that patented projects are not more likely to obtain funding in comparison to non-patented projects. However, patent-pending projects—where patent applications are filed but not yet issued—exhibit statistically significant, positive results. The patent-pending projects are more likely to be successfully funded compared to both patented and non-patented projects—both for live and mock campaigns.

With regard to the real-world campaigns, the delivery for funded patented campaigns is delayed substantially longer than their non-patented counterparts. Patent-pending projects also evidence greater delivery delays than projects not seeking patent protection.

These results, particularly those that are supported by both aspects of the study, provide insights into the extent that patent status labels help attract funding and facilitate ultimate commercialization. Regarding patents, the results are contrary to most of the current literature, because saying the project is patented has no statistically significant correlation with the campaign being successful or respondents to the mock campaigns being likely to invest in or buy the innovation.

And the patent-pending results provide a new insight not yet recognized in the literature—that this patent status can positively influence investment and purchase in the so-labeled product. The possible mechanism is that having a patent pending may signal, and evidence, that the innovation is both new and can benefit greatly from crowdfunding, while projects already patented may be innovations that are older, less in need of crowdfunding, and potentially already failed to secure traditional funding.

The increased delays in delivery observed for patented, and even patent-pending innovations are possibly contrary to patent theory that suggests patenting facilitates commercialization. But here, the delay compared to non-patented products may be due to the complexity of patented, or patent-pending, projects in comparison to non-patented ones, not the result of a negative effect of the patent. Notably, these findings are limited to the crowdfunding context, making extrapolation of the patent-related findings to other funding and commercialization environments limited.

This Article proceeds as follows. First, Part II describes the current theories and literature regarding patenting and crowdfunding and their signaling of quality, attracting funding, and facilitating commercialization of innovation. Part III sets forth the study's data and methods, describes the specific dataset of 9,184 Kickstarter campaigns used to study patents and crowdfunding and the coding that was done, and explains the "mock" Kickstarter experiment where 1,509 respondents were randomly assigned two different Kickstarter campaigns whose patent status randomly varied between patented, patent-pending, or silent on patent status. Part IV details the results, focusing on the relationship between patents and (1) successful funding or willingness to invest or buy, (2) successful delivery, and (3) delay, if any, in delivery. Part V concludes, discussing implications of the findings, including implications on the patent marking statutes and where to emphasize what types of patent status should be properly placed.

II. BACKGROUND

A. *Patents as Signals and Facilitators of Commercialization*

A patent is a government grant of exclusivity over an invention for a limited time.¹⁰ The patent itself is a written document that describes the invention and how to make it and defines the invention and thus, the scope of exclusivity.¹¹ In order to obtain a patent, an inventor must file a patent application that is then examined by a government official to determine whether the claimed invention is eligible for patent protection.¹² In the United States, this is done by a patent examiner who determines whether the claimed invention is new—having not been done before—and nonobvious—enough of a technological advance to warrant protection.¹³ Patent applications typically pend, on average, 2.5 years at the

10. 35 U.S.C. § 154; Cotropia, *supra* note 1, at 1864 ("Patent claims define the area of exclusivity granted by the patent."); WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW* 294–96 (2003).

11. 35 U.S.C. § 112; Cotropia, *supra* note 1, at 1860–61.

12. Michael D. Frakes & Melissa F. Wasserman, *Is the Time Allocated to Review Patent Applications Inducing Examiners to Grant Invalid Patents? Evidence from Microlevel Application Data*, 99 *REV. ECON. & STAT.* 550, 551 (2017) ("Every patent application filed with the Patent Office contains a specification, which describes the invention, and a set of claims, which defines the metes and bounds of the legal rights the applicant is seeking. . . . The assigned examiner then assesses the patentability of the invention based on the criteria outlined in the Patent Act."); Mark A. Lemley & Bhaven Sampat, *Is the Patent Office a Rubber Stamp?*, 58 *EMORY L.J.* 181, 181 (2008).

13. 35 U.S.C. §§ 101–103; Michael D. Frakes & Melissa F. Wasserman, *Does the US Patent and Trademark Office Grant Too Many Bad Patents?: Evidence from a Quasi-Experiment*, 67 *STAN. L. REV.* 613, 620 n.24 (2015) ("In order for an invention to be patent eligible it must be both new and represent a nontrivial advancement over current scientific understanding."); Christopher A. Cotropia, *Predictability and Nonobviousness in Patent Law After KSR*, 20 *MICH. TELECOMM. & TECH. L. REV.* 391, 409 (2014) ("[O]bviousness determinations are made . . . by patent examiners, who review patent applications for patent eligibility . . ."); Mark A. Lemley & Bhaven Sampat, *Examiner Characteristics and Patent Office Outcomes*, 94 *REV. ECON. & STAT.* 817, 818 (2012) ("Once applications arrive at the PTO, . . . [e]xaminers . . . assess the novelty and nonobviousness of the claims in the application relative to what is disclosed in the complete list of prior art—the prior art references from the applicant, plus any discovered through the examiner's own search.").

patent office before issuing as a granted patent.¹⁴ Once issued, a U.S. patent gives the inventor twenty years of exclusivity from the date of filing.¹⁵ And the patent can exclude even “innocent infringers”—those who came in second, having developed the invention on their own but after the inventor.¹⁶

Patents are part of the innovation ecosystem, believed to, in part, incentivize and facilitate manufacturer and commercialization of the claimed invention.¹⁷ The theory behind this is multifold. First, the potential of patenting is meant to incentivize the initial creation of the invention—the idea.¹⁸ The prospect of ultimately selling a commercial embodiment of the invention at higher-than-normal prices or by licensing the invention to others for a fee is meant to incentivize the would-be inventor to take the first steps of creation.¹⁹ Second, the granted patent’s exclusivity helps the patentholder coordinate development and commercialization efforts regarding the claimed invention among several players, reducing duplicated costs and preventing competitors’ use of unpatentable information generated in the process.²⁰ This “prospect theory” views patent exclusivity as

14. U.S. PATENT & TRADEMARK OFF., PERFORMANCE AND ACCOUNTABILITY REPORT FY17 (2017), <https://www.uspto.gov/sites/default/files/documents/USPTOFY17PAR.pdf> [<https://perma.cc/VDV3-8UB6>] [hereinafter USPTO].

15. 35 U.S.C. § 154(a)(2).

16. Samson Vermont, *Independent Invention as a Defense to Patent Infringement*, 105 MICH. L. REV. 475, 478 (2006) (“Under current U.S. law, the second to invent generally comes up empty-handed. Suppose inventor Smith and inventor Jones toil away for years in separate efforts to build a better mousetrap. They conceive of essentially the same design but Smith does so a few months after Jones. Smith and Jones separately perfect the design, file for patents, and then start commercializing the mousetrap. Under U.S. law, only inventor Jones will receive a valid patent. As soon as Jones’s patent issues . . . Smith can no longer make, use, or sell the mousetrap unless Smith acquires a license from Jones.”).

17. Cotropia, *supra* note 1, at 1900 (“[A] theory of patent law describes exclusivity as the driving force behind innovation—or commercialization—and the eventual diffusion of the patented technology. Patent law’s main goal . . . is to facilitate the commercialization of the invention, not just encourage the underlying invention’s creation.” (footnote omitted)); Kitch, *supra* note 2, at 276–77 (“In the case of many patents, extensive development is required before any commercial application is possible The investments may be required simply to apply existing technology to the manufacture and design of the product”); Lemley, *supra* note 2, at 130 (“[I]ntellectual property protection is necessary to encourage the intellectual property owner to make some further investment in the improvement, maintenance, or commercialization of the product.”); Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 843 (1990) (discussing patent incentives on the post-invention environment for development and subsequent improvements); Sichelman, *supra* note 2, at 357 n.98 (“Current patent law does provide some targeted, yet still indirect, incentives to commercialize inventions.”).

18. Cotropia, *supra* note 1, at 1892 (“Under [the incentive-to-invent] theory, patent law incentivizes the creation of inventions”); see also LANDES & POSNER, *supra* note 10 at 306–07.

19. Lemley, *supra* note 2, at 133 (“[P]rospect theory depends upon two premises. The first is that creators will not invest in putting their invention to efficient use unless they obtain exclusive rights to the invention [first]. . . . [The] second premise—that the patent owner’s monopoly right should result in efficient licensing to both end users and potential improvers—rests on the Coasean assumptions of perfect information, perfect rationality, and zero transaction costs.”).

20. Cotropia, *supra* note 1, at 1900–01 (“Patent law’s main goal, under [prospect] theory, is to facilitate the commercialization of the invention, not just to encourage the underlying invention’s creation The patent’s exclusivity forces everyone who wants to increase the invention’s value to make arrangements with the patent owner. This both allows for efficient coordinated development and discourages wasteful duplication of efforts.” (footnotes omitted)); John F. Duffy, *Rethinking the Prospect Theory of Patents*, 71 U. CHI. L. REV. 439, 441 (2004) (“Prospect patents . . . put their owner ‘in a position to coordinate the search for technological and market enhancement of the patent’s value,’ and that coordination ‘increases the efficiency with which investment

promoting the investment needed to actually make and sell the invention.²¹ For example, the theory goes that venture capitalists are more likely to invest in companies that have patent protection because such patenting will protect the company from competitors and allow them to control price.²² Once investment is secured, patents are supposed to help pave the way toward commercialization because they remove certain coordination problems.²³

Finally, the patent document, not the resulting exclusivity, provides “signals” to potential investors that a company has the wherewithal to conceive of new and non-obvious inventions and the discipline to document that knowledge.²⁴ This “signaling” theory views the patent as a “proxy for hard-to-measure capabilities and assets” and increases the chances the inventor, particularly in a start-up company, will be able to attract investment.²⁵ Others assert that patents signal a company’s sophistication and its invention’s technical worth, thus attracting investment.²⁶

Previous empirical studies examine whether patenting facilitates commercialization, particularly for early-stage developments.²⁷ A few of note include multiple studies finding that having patents helped companies receive investment and venture capital funding.²⁸ Others found that patents send an important signal

in innovation can be managed.”); Kitch, *supra* note 2, at 276 (“[T]he patent owner has an incentive to make investments to maximize the value of the patent without fear that the fruits of the investment will produce unpatentable information appropriable by competitors.”); *see also* Lemley, *supra* note 2, at 133 (discussing Kitch’s two premises of prospect theory).

21. Kitch, *supra* note 2, at 276–77 (“[A] patent ‘prospect’ increases the efficiency with which investment in innovation can be managed. . . . Thus, the potential gains from exclusive ownership are particularly large. No one is likely to make significant investments searching for ways to increase the commercial value of a patent unless he has made previous arrangements with the owner of the patent. This puts the patent owner in a position to coordinate the search for technological and market enhancement of the patent’s value . . .”).

22. *See* Sichelman, *supra* note 2, at 347–53; *see also* Bronwyn Hall & Dietmar Harhoff, *Recent Research on the Economics of Patents*, 4 ANN. REV. ECON. 541, 552–53 (2012).

23. Christopher A. Cotropia, *The Folly of Early Filing in Patent Law*, 61 HASTINGS L.J. 65, 82–84 (2009) (discussing the benefits of early filing on the ability of patent owners to maximize the development and improvement of the patented invention, share information with others without fear of misappropriation, and encourage companies to invest in early-stage investment, all with an eye toward post-invention commercialization); Lemley, *supra* note 2, at 130 (“[I]ntellectual property protection is necessary to encourage the intellectual property owner to make some further investment in the improvement, maintenance, or commercialization of the product”); Sichelman, *supra* note 2, at 347–53 (discussing the path from invention to commercialization); *see also* Kieff, *supra* note 2, at 707–12 (discussing the activities that take place after an invention is made but before it may be commercially exploited).

24. Sichelman, *supra* note 2, at 378 (“[P]atents may play important roles in providing ‘signals’ to potential investors that a company has the wherewithal to conceive of new and non-obvious inventions and the discipline to document that knowledge.”).

25. *Id.*; Hall & Harhoff, *supra* note 22 (“One consequence of patents viewed as property rights to intangible assets is that they may be useful signals to investors that a startup firm has valuable assets even in the absence of a current profit stream.”).

26. *See* Long, *supra* note 3, at 645–46.

27. *See* Hall & Harhoff, *supra* note 22, at 542, 46–48.

28. Christian Helmers & Mark Rogers, *Does Patenting Help High-Tech Start-Ups?*, 40 RSCH. POL’Y 1016, 1025–26 (2011) (“Start-up firms could be using patents as a signal to capital markets, which then allows them to borrow more. Patents may also assist young firms in securing venture investment by turning intrinsically intangible knowledge into a property right, which increases the salvage value in case the venture fails.”); David H. Hsu & Rosemarie H. Ziedonis, *Patents as Quality Signals for Entrepreneurial Ventures*, 2008 ACAD. MGMT. PROC. 1, 6 (2008) (“The results provide new evidence that patenting can positively affect investors’ perceptions

to venture capital investors and aid in obtaining later-stage financing.²⁹ Graham, Merges, Samuleson, and Sichelman surveyed 1,332 early-stage technology companies and found patenting more widespread than previously reported and that “early-stage companies patent . . . often seeking competitive advantage, and the associated goals of preventing technology copying, securing financing, and enhancing reputation.”³⁰ In a subsequent study, Graham and Sichelman further examine the study’s results and conclude that entrepreneurs patent for “signaling” reasons, such as “improv[ing] their chances of securing investment.”³¹

B. Crowdfunding as a Facilitator of Commercialization

Crowdfunding can take many forms, but is essentially a request online for resources, in some form, to support a described project.³² The typical requested resource is money and the project seeking support is typically a product or service.³³ The funding provided can be in the form of equity in the project, a reward for providing funding, a loan, or a simple donation.³⁴ The reward for many crowdfunding campaigns is the subject of the campaign itself—the product or service (essentially “preselling”).³⁵ Reward-based crowdfunding is the most prevalent currently, with popular crowdfunding sites such as Kickstarter and Indiegogo.³⁶ A crowdfunding campaign is defined by a goal and how contributors

of start-up quality across multiple stages of the entrepreneurial life cycle, as measured by the likelihood of receiving initial backing from a prominent venture capitalist, by unexpected increases in valuation estimates across rounds of financing, and by the probability of successful exit through an initial public offering.”); see Ronald J. Mann & Thomas W. Sager, *Patents, Venture Capital, and Software Start-ups*, 36 RSCH. POL’Y 193, 200 (2007) (“Many investors also value patents because of information they convey about the operational competence of the firm’s management.”).

29. Carolin Haeussler, Dietmar Harhoff & Elisabeth Mueller, *How Patenting Informs VC Investors—the Case of Biotechnology*, 43 RES. POL’Y 1286, 1296 (2014) (“[T]he mere existence of patent applications reduces the time to receiving VC financing, presumably because an application reflects progress in the development of a technology.”); Ronald Mann, *Do Patents Facilitate Financing in the Software Industry*, 83 TEX. L. REV. 961, 985 (2005) (“[I]nterviews suggest a series of benefits that patents might provide for later-stage . . . startups.”).

30. Stuart J.H. Graham, Robert P. Merges, Pamela Samuelson & Ted M. Sichelman, *High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey*, 4 BERKELEY TECH. L.J. 1255, 1255 (2009).

31. Ted Sichelman & Stuart J.H. Graham, *Patenting by Entrepreneurs: An Empirical Study*, 17 MICH. TELECOMM. & TECH. L. REV. 111, 165 (2010) (discussing the differences in signaling by firms with fewer patents filed versus those with more and finding that “firms with fewer numbers of patents filed, [use] patents to improve their chances of securing investment” at a lower rate “than . . . firms filing a greater number of patents.”).

32. Mollick, *supra* note 5, at 2 (“Crowdfunding refers to the efforts by entrepreneurial individuals and groups . . . to fund their ventures by drawing on relatively small contributions from a relatively large number of individuals using the internet”); see also Paul Belleflamme, Thomas Lambert & Armin Schwenbacher, *Individual Crowdfunding Practices*, 15 VENT. CAP. J. ENTREPRENEURIAL FIN. 313, 313 (2013).

33. Magdalena Cholakova & Bart Clarysse, *Does the Possibility to Make Equity Investments in Crowdfunding Projects Crowd Out Reward-Based Investments?*, 39 ENTREPRENEURSHIP THEORY & PRAC. 145, 147–48 (2015) (providing a brief history of crowdfunding and recent examples of successful crowdfunding campaigns).

34. Stanko & Henard, *supra* note 4, at 785 (“Crowdfunding takes several forms, such as equity-based, reward-based, lending-based and donation-based.”).

35. Mollick, *supra* note 5, at 3 (“[R]eward-based crowdfunding treats funders as early customers, allowing them access to the products produced by funded projects at an earlier date, better price, or with some other special benefit.”).

36. *Id.* at 4.

can move the campaign closer to the defined goal.³⁷ Crowdfunding is seen by many as a mechanism for entrepreneurial individuals to fund their projects, typically new ventures, by getting small contributions from a large number of individuals.³⁸

In the innovation context, crowdfunding is another, albeit unique, funding mechanism to facilitate the commercialization of a particular project.³⁹ The funding from the campaign itself can foster innovation.⁴⁰ Funding obtained is used to further research, develop, and/or produce the subjects of the campaign.⁴¹ In this way, crowdfunding acts as an alternative to other funding mechanisms for startups such as venture capital funding.⁴² This is even the case with reward-based crowdfunding because, even though contributors to such campaigns are not receiving equity in the project, such contributors feel like they are “investing” in the project.⁴³ Contributors believe they are “part” of the project and their contribution, however small, was important to bringing the product or service to market.⁴⁴ Crowdfunding can also further innovation by acting as a marketing tool—creating buzz around a product or service in its early stages.⁴⁵ Crowdfunding sites provide a platform for the inventor to communicate the advantages of their product or service and gain media attention.⁴⁶

Much of the current research regarding crowdfunding focuses on “what determines the likelihood of a crowdfunding campaign achieving its funding

37. Ajay K. Agrawal, Christian Catalini & Avi Goldfarb, *Some Simple Economics of Crowdfunding*, 14 INNOVATION POL'Y & ECON. 63 (2014) (discussing Eric Migicovsky's successful crowdfunding campaign to fund his “Pebble” watch).

38. See Stanko & Henard, *supra* note 4, at 784.

39. *Id.* at 786.

40. *Id.* at 784.

41. Cholakova & Clarysse, *supra* note 33, at 147.

42. SCHWIENBACHER & LARRALDE, *supra* note 5, at 4.

43. Belleflamme et al., *supra* note 6, at 589 (“In addition to earning money on their investment, participants can interact with company founders and receive updated information on the firms' most recent developments, getting in return a feeling of belonging to a community of investors.”); Ajay K. Agrawal, Christian Catalini & Avi Goldfarb, *The Geography of Crowdfunding*, 1, 3 (Nat'l Bureau of Econ. Rsch., Working Paper No. w16820, 2011) (discussing how crowdfunding “enable[s] users to make investments in various types of projects and ventures” and how the platform “facilitate[s] direct interaction between investor(s) [and] the individuals raising funds”).

44. Agrawal et al., *supra* note 37, at 73 (discussing how “funders engage in crowdfunding for at least five distinct incentives[,]” which include: access to investment opportunities, early access to new products, community participation, support for a product, service, or idea, and formalization of contracts); Elizabeth M. Gerber, Julie Hui & Pei-Yi Kuo, *Crowdfunding: Why People Are Motivated to Post and Fund Projects on Crowdfunding Platforms*, in PROCEEDINGS OF THE INTERNATIONAL WORKSHOP ON DESIGN, INFLUENCE, AND SOCIAL TECHNOLOGIES: TECHNIQUES, IMPACTS AND ETHICS (2012) (discussing the various reasons why “funders” engage in crowdfunding).

45. Stanko & Henard, *supra* note 4, at 786.

46. Agrawal et al., *supra* note 37, at 74 (“Crowdfunding platforms also have an incentive to attract projects that can generate a disproportionate share of media attention, because they expand the existing community of funders (further increasing network effects) and allow the platform to expand into new categories.”); Gerber et al., *supra* note 44 (“Initial findings suggest that creators were motivated to participate in crowdfunding because it expanded their awareness through social media.”).

goal”⁴⁷ Ethan Mollick found that personal networks, the project’s quality, and geography are associated with crowdfunding success.⁴⁸ Others found that focusing on the community, communication, and professionalism help crowdfunding campaigns succeed.⁴⁹ The geographic proximity between the campaign and the contributor is also relevant.⁵⁰ The philanthropic nature of the campaign is also correlated with success.⁵¹ Some studies examine what happens after crowdfunding success.⁵² For example, Mollick explored what types of projects actually delivered and whether that delivery was on time.⁵³ Stanko and Henard studied the innovation consequences of crowdfunding, finding that the number of backers, not the amount of funding raised, influences product market performance after funding.⁵⁴

Some have studied the interaction between patents and crowdfunding, but these studies take place in different settings, on a very small scale, and do not explore the implications of identifying a project as patent-pending.⁵⁵ Furthermore, Ahlers, Cumming, Günther, and Schweizer studied the characteristics of successful equity crowdfunding campaigns and found, in part, that patenting has little to no impact on the success of equity financing.⁵⁶ Meoli, Munari, and Bort compared 272 patented Kickstarter campaigns to a similar set of 272 unpatented Kickstarter campaigns and found that declaring the underlying possession of a

47. Stanko & Henard, *supra* note 4, at 786. *See generally* Ricarda B. Bouncken, Malvine Komorek & Sascha Kraus, *Crowdfunding: The Current State of Research*, 14 INT’L. BUS. & ECON. RSCH. J. (ONLINE) 407 (2015) (briefly discussing the current state of crowdfunding research).

48. Mollick, *supra* note 5, at 8, 13 (“Social capital and preparedness are associated with an increased chance of project success, suggesting that quality signals play a role in project outcomes. Geography also appears to be linked to the nature and success rates of projects.”).

49. Goran Calic & Elaine Mosakowski, *Kicking Off Social Entrepreneurship: How a Sustainability Orientation Influences Crowdfunding Success*, 53 J. MGMT. STUD. 738, 740 (2016) (discussing how a project’s “sustainability orientation” increases funding success in crowdfunding); Thomas Müllerleile & Dieter William Joensen, *Key Success-Determinants of Crowdfunded Projects: An Exploratory Analysis*, in DATA SCIENCE, LEARNING BY LATENT STRUCTURE, AND KNOWLEDGE DISCOVERY 271, 280 (Berthold Lausen et al. eds. 2015); Julie S. Hui, Michael D. Greenberg & Elizabeth M. Gerber, *Understanding the Role of Community in Crowdfunding Work*, in ACM PROC., 62, 71 (2014) (“While both entrepreneurship and crowdfunding rely on collaboration to achieve project goals, crowdfunding inherently relies more on community support for project success.”).

50. Mingfeng Lin & Siva Viswanathan, *Home Bias in Online Investments: An Empirical Study of an Online Crowdfunding Market*, 62 MGMT. SCI. 1393, 1394, 1412 (2015) (discussing findings that home bias persists in crowdfunding).

51. Belleflamme et al., *supra* note 32, at 19.

52. *See, e.g.*, Mollick, *supra* note 5, at 6–13.

53. *Id.* at 12.

54. Stanko & Henard, *supra* note 4, at 794 (“While raising capital is obviously important and necessary to entrepreneurs and startups, the amount of funding raised through reward-based crowdfunding is not found to be significantly related to the later market success of that product. This research suggests that much of the value of crowdfunding to innovating entrepreneurs lies in the non-financial benefits that come with attracting backers. We find that the number of backers involved in a crowdfunding campaign is a key driver of the market performance of the crowdfunded product.”).

55. *E.g.*, Azzurra Meoili, Federico Munari & James Bort, *The Patent Paradox in Crowdfunding: An Empirical Analysis of Kickstarter Data*, 28 INDUS. & CORP. CHANGE 1321, 1321 (2019) (discussing the “negative signaling role of patents” in crowdfunding and angel investor situations).

56. Gerrit K.C. Ahlers, Douglas Cumming, Christina Günther & Denis Schweizer, *Signaling in Equity Crowdfunding*, 39 ENTREP. THEORY & PRAC 955, 974 (2015) (finding patents had little or no significant impact on funding success).

patent negatively affects the likelihood of success.⁵⁷ Notably, neither of these studies examined the impact of patents, and, in particular, pending patent applications, on a large scale in the most common, reward-based crowdfunding environment.⁵⁸ Furthermore, neither examined the impact of patenting on delivery or delivery delay, a critical part of the innovation environment.⁵⁹

III. STUDY

A. *Research Questions*

This study uses crowdfunding data—both from live and mock Kickstarter campaigns—to test whether crowdfunding campaigns that mention their patent status (patented or pending patent) are more successful in securing funding, being delivered, and being delivered on time as compared to those that are silent on patent status. Previous research regarding crowdfunding indicates that contributors do look for signs of project quality before pledging to a campaign.⁶⁰ And patent theory asserts that patents signal product quality—either that the product is uniquely innovative and thus technologically superior or that the patentholder is organized and thus more likely to produce a working product and reach commercialization goals.⁶¹ This study will provide insights into these two areas of research—the patent literature on whether patents help innovators secure funding and, in turn, make commercialization both more likely and easier and the entrepreneurship literature on factors that lead to crowdfunding success.⁶²

More specifically, the study uses data from Kickstarter,⁶³ a crowdfunding site, and a companion laboratory experiment via MTurk, to test whether crowdfunding campaigns that identify their products as covered by patents, or by pending patent applications, are more likely to: (1) reach their funding goals compared

57. See Meoili et al., *supra* note 55, at 1326, 1336 (“The perception of high complexity and low familiarity can be seen as a negative signal for the receivers, which can have a negative effect on the ultimate success of a project . . . Moreover, projects signaling patents tend to have higher degrees of innovation and thus, might be perceived as very far from the market and less usable to the general crowd.”).

58. See Mollick, *supra* note 5, at 3.

59. See *id.* at 12 (discussing the statistical likelihood that a project delivers and whether, or to what degree, those projects and/or products are delayed).

60. *Id.* at 14 (discussing the study’s findings and that “the relevance of signals of quality . . . suggest that funders engage in some assessment of the potential of founders seeking crowdfunding” before engaging with the campaign).

61. Sichelman, *supra* note 2, at 377 (“[T]he patent system . . . serve[s] . . . important goals, such as the disclosure of new and non-obvious information, the signaling of technological capability within and outside firms, and the reduction of transaction costs in business dealings.”); see Long, *supra* note 3, at 637 (“By conveying information to observers in a controlled and credible way, patents can have positive private value to firms. . .”).

62. See, e.g., Bouncken et al., *supra* note 47, at 407; Mollick, *supra* note 5, at 1; Sean M. O’Connor, *Crowdfunding’s Impact on Start-Up IP Strategy*, 21 GEO. MASON L. REV. 895, 896 (2014); Kitch, *supra* note 2, at 265.

63. KICKSTARTER, <https://www.kickstarter.com/> (last visited Nov. 23, 2020) [<https://perma.cc/D9LP-Q3PW>].

to those campaigns with no patents; (2) be delivered compared to those campaigns with no patents; and (3) meet their delivery date compared to those campaigns with no patents.

B. *Data and Methods*

1. *Observational Data from Kickstarter*

This study collected the universe of Kickstarter campaigns in the Technology category from the website's inception in 2009 to June 1, 2017. While Kickstarter has other categories, the Technology category was chosen because it is the one category where the campaigns are most likely to involve products that are eligible for patent protection.⁶⁴ This category includes the following subcategories: 3D Printing, Apps, Camera Equipment, DIY Electronics, Fabrication Tools, Flight, Gadgets, Hardware, Makerspaces, Robots, Software, Sound Exploration, Wearables, and Web.⁶⁵ The initial data collection returned information on 9,801 campaigns.⁶⁶

Both non US-originated campaigns and live campaigns were removed from the dataset. The 617 currently "live" campaigns were dropped because the research focused on completed campaigns so that success and delivery of the campaign could be observed. Of the remaining campaigns, 3,038 (30.99%) were campaigns that originated from outside the United States. However, many of these campaigns—2,119 (69.75%)—had goals that were identified in United States Currency—the U.S. dollar.

After these still-live campaigns were removed, 9,184 completed campaigns in the Technology category were left. These completed campaigns represented over 230.1 million dollars in pledges. And of the 9,184 campaigns, 2,773 were funded (30.19%). This result matches findings from previous Kickstarter studies.⁶⁷

For these campaigns, basic attributes about the campaign that could provide some insight into the quality of the campaign, and thus, its chances of success, were coded—similar to those attributes observed in previous studies.⁶⁸ This included the start and end date of the campaign (and thus, how long the campaign lasted), the Technology subcategory the campaign was listed in, the geographic location of the campaign (city and state), the monetary goal of the campaign, the number of bidders, and the final total amount pledged by these bidders. The actual content of the Kickstarter campaign was also coded, including whether images and videos were used. The textual description of the campaign was also examined for common spelling errors. Observers can also comment on a campaign, both before and after its completion, and thus the number of comments

64. See 35 U.S.C. § 101 (2018); Michael Risch, *Everything Is Patentable*, 75 TENN. L. REV. 591, 593 (2008) ("[T]he primary justification for patent law is to encourage new technologies.")

65. KICKSTARTER, *supra* note 63.

66. WEB ROBOTS, <https://webrobots.io/> (last visited Nov. 23, 2020) [<https://perma.cc/YK8E-LTFE>].

67. See Mollick, *supra* note 5, at 5 tbl.1.

68. *Id.* at 1.

was coded. The campaign can also be updated both before and after completion, and the number of updates was recorded.⁶⁹ Finally, whether the campaign was fully funded, and thus successful, was also coded.

Of specific import for this research project, the campaign's textual description was also coded to see if the campaign indicated that the project was either already patented and/or a patent application was filed and pending. This was done by initially identifying the number of campaigns that mentioned the word "patent" (or relevant derivations) in their description. Those campaigns were then hand coded.

A random sample of fully-funded campaigns was further coded to see if the promised product was actually delivered, if it was, and when delivery occurred. This consisted of coding 374 fully funded campaigns falling into two Technology subcategories that were patent and patent-pending rich—the Hardware and Gadget categories. The ultimate delivery date was also compared to the promised delivery date given by the campaign.

2. *Laboratory Experiment with Mock Kickstarter Campaigns*

The second study is a laboratory experiment on Amazon Mechanical Turkers ("MTurkers"),⁷⁰ randomly providing subjects with an image of a "mock" Kickstarter campaign that is labeled as "patented," "patent-pending," or silent on patenting. The subjects answered a series of questions about the campaign, permitting one to learn more about whether the specific patent status is recognized, understood, and whether it correlates with specific views about the campaign.

Two "mock" Kickstarter campaigns were created—one featuring headphones and the other foldable flip-flops. The campaigns had three presentations with the only difference being the patent-status displayed—patented, patent-pending, and no information on patenting. The three versions of the headphones campaign are shown below in Figures 1–3.

69. KICKSTARTER, *supra* note 63; Mollick, *supra* note 5, at 6.

70. Mechanical Turk is commonly used to get subjects for surveys and administer them. Gabriele Paolucci, Jesse Chandler & Panagiotis Ipeirotis, *Running Experiments on Amazon Mechanical Turk*, 5 JUDGMENT & DECISION MAKING 411, 411–13 (2010) (explaining the origins and functions of Mechanical Turk).

FIGURE 1

KICKSTARTER

3D Audio, Voice Search & Noise Canceling Headphones



Headphones with touch controls, motion sensors, and music storage.

Looking for crowdfunders to fund this project and help bring it to market.

FIGURE 2

KICKSTARTER

3D Audio, Voice Search & Noise Canceling Headphones



Patented headphones with touch controls, motion sensors, and music storage.

Looking for crowdfunders to fund this project and help bring it to market.

FIGURE 3

KICKSTARTER

3D Audio, Voice Search & Noise Canceling Headphones



Patent-Pending headphones with touch controls, motion sensors, and music storage.

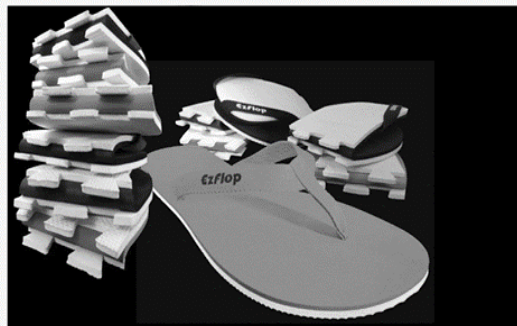
Looking for crowdfunders to fund this project and help bring it to market.

An example of the flip-flop mock campaign is shown below in Figure 4, where it is identified as patent-pending. There were also “patented” and no patent status campaigns.

FIGURE 4

KICKSTARTER

EzFlop Flip Flops - Recyclable Flip Flop



Recyclable and foldable flip flops for your feet.

Looking for crowdfunders to fund this project and help bring it to market.

These two campaigns, with three variations for each, were randomly displayed to 1,511 MTurkers. Prior to showing them the campaign, a series of ques-

tions were asked to determine their experience with crowdfunding and Kickstarter in particular. They were then presented with the randomly selected campaign and told to “[p]lease take a moment to study the campaign because you will **not be allowed to come back and look at it** when answering the questions that follow.”

They were then asked whether the product shown was innovative and well-made and whether they were likely to buy, invest, and recommend the product. The respondents were asked to rate their answers on a five-point Likert scale from “not likely” to “extremely likely.”⁷¹ They were also asked, on a ten-point scale, how important four factors—price, value, quality, and innovation—were to the product shown. The respondents were also asked if the product they saw was patented, had a patent pending, neither, they didn’t notice, or the campaign didn’t say.

All respondents were also randomly presented questions to test their knowledge on the patent process (how a patent is obtained), the difference between patented and patent-pending, and how, in general, a product’s patented or patent-pending status would influence their decisions to buy or invest in that product. The survey ended with a series of demographic questions.

IV. RESULTS

A. *General Patent Knowledge and Relationship to Buying and Investing*

In the MTurk experiment, respondents were asked general questions about the patenting system and whether patent status would influence their likelihood to invest in or buy a particular product. Most respondents correctly identified how someone gets a patent, with 89.9% selecting “files for approval from a government agency” and “obtains approval from a government agency.” Respondents also understood the difference between an invention being patented (86.5% responding “[a] patent was granted”) and patent-pending (78.1% responding “[a] patent application has been filed”).

The respondents also indicated whether the patented or patent-pending status of a product would make them more or less likely to invest in or buy the identified product. The results are reported in Table 1 below.

71. See ALLEN RUBIN & EARL BABBIE, RESEARCH METHODS FOR SOCIAL WORK 179 (1989) (explaining the use of a Likert scale to quantify attitudinal items in a survey).

TABLE 1: MTURKER’S LIKELIHOOD TO BUY AND INVEST IN PATENTED AND PATENT-PENDING PRODUCTS

	Buy		Invest	
	<i>Patented</i>	<i>Patent-Pending</i>	<i>Patented</i>	<i>Patent-Pending</i>
Much more likely	108 (7.2%)	23 (1.5%)	193 (12.8%)	43 (2.9%)
More likely	424 (28.1%)	217 (14.4%)	766 (50.8%)	444 (29.4%)
No effect	934 (61.9%)	1,130 (74.9%)	482 (31.9%)	783 (51.9%)
Less likely	32 (2.1%)	115 (7.6%)	58 (3.8%)	192 (12.7%)
Much less likely	11 (0.7%)	24 (1.6%)	10 (0.7%)	27 (3.1%)

Overall, most respondents thought being patented, or having a patent-pending, had no effect on whether they would buy or invest in a product. A product’s “patented” status was more likely to have a positive influence on investment or purchase decisions as compared to a “patent-pending” status. And the positive influence for both statuses was stronger when investing in a product as compared to buying it.

The results varied slightly if the respondent correctly understood the patenting process. For example, such knowledgeable individuals were more likely to reply that a “patent-pending” status has “no effect” on both investment and buying decisions of that product. In contrast, those individuals who were knowledgeable about the patenting process were more likely to invest in patented products, but still mostly responded “no effect” on buying the patented product.

These general results slightly confirm general patent theory. The results indicate that those who were knowledgeable about the patent process were more likely to invest in patented products, while having a patent pending had mostly no effect. The commercialization theory of patent law supports this finding—with patents more likely to attract investment, not end-consumer purchases. This also indicates that the signal from patents is more directed toward investors, not purchasers. And merely having a patent-pending does not grant the exclusivity that, under patent theory, is supposed to attract such commercial investment. The results bear this out.

But, overall, the majority of respondents saw patents playing no role in their buying decision—regardless of whether the product is patented or has a patent-pending. And for investing, this only had a majority, positive effect for patented products, not patent-pending products. This majority effect was not much over 50%—with 959 respondents, 63.4% had a positive response to patenting when deciding to invest. The signal is present for patented and investing, but still weak. But a majority of respondents did not see a signal for patent-pending status or patented when considering to buy.

B. Patents and Crowdfunding Campaign Success

The question still remains whether these general sentiments play out in practice. When contextualizing the patent status in a real Kickstarter campaign or mock campaign, the study attempts to learn whether signaling takes place and patented, or patent-pending, campaigns are favored with all other relevant factors remaining constant.

1. Live Kickstarter Campaigns

Initial summary statistics are reported below in Table 2 for all of the U.S. completed campaigns in the dataset, with the mean and median (in parentheses) reported.

TABLE 2: SUMMARY STATISTICS

	ALL	FUNDED	NOT FUNDED	PATENTED	PATENT-PENDING	NO PATENT
FUNDED	0.283			0.280	0.322	0.281
	(0)			(0)	(0)	(0)
US BASED	0.669	0.679	0.665	0.670	0.658	0.671
GOAL (\$)	83,456.15	24,165.43	106,850	90,220.01	79,272.49	83,487.50
	(17,000)	(10,000)	(20,000)	(40,000)	(30,000)	(15,000)
FUNDED %	5.38	18.51	0.200	5.53	2.20	5.81
	(0.136)	(1.459)	(0.044)	(0.119)	(0.195)	(0.133)
BACKERS	181.44	544.87	38.04	399.96	351.43	161.30
	(21)	(144)	(11)	(32)	(40)	(19)
PLEDGE/ BACKER (\$)	124.03	176.49	103.33	175.97	175.09	117.81
	(60.91)	(93.30)	(50.025)	(96.68)	(97.06)	(57.86)
UPDATES	5.43	14.28	1.94	7.29	7.79	5.18
	(2)	(11)	(1)	(3)	(3)	(2)
COMMENTS	58.61	192.41	5.80	118.75	108.44	52.96
	(2)	(24)	(0)	(4)	(4)	(1)
DURATION (DAYS)	33.49	32.69	33.80	36.17	34.01	33.33
	(30)	(30)	(30)	(30.24)	(30)	(30)
PATENTED	0.039	0.038	0.039		0.077	0.000
PATENT-PENDING	0.076	0.084	0.072	0.195		0.000
OBSERVATIONS	9184	2773	6,411	336	714	8,161

Notably, and perhaps not surprisingly, patented and patent-pending campaigns have higher goals and higher pledge amounts per backer as compared to

those with no patents.⁷² This suggests that such projects involve more capital-intensive technologies (or is at least perceived as such by the campaigner) or have longer development cycles.⁷³ The number of comments is higher for these patent and patent-pending campaigns as well—almost double compared to campaigns with no patent—indicating more community engagement for the patent campaigns.

A higher percentage of patent-pending campaigns are funded (33.5% compared to 31.5% for patented and 30.03% for no patent). Patent-pending campaigns, even when including failed campaigns, also get a higher percentage of their funding. In fact, patented campaigns obtain a lower percentage of their funding overall compared to no patent campaigns. This descriptive data indicates that patent-pending campaigns are more successful, and get more funding, than no patent and patented campaigns. In turn, patented campaigns fare worse than even no patent campaigns.

A logistic regression of the odds of successful funding was performed to further explore the relationship between patents and crowdfunding success. When performing the regression, a number of controls were introduced to test the unique influence of indicating that the campaign was either patented or had a patent pending. Specifically, factors that may influence success were controlled for, including the log of the goal of the campaign, the campaign's Technology subcategory, how long the campaign lasted, the year the campaign was listed, the geographic location of the campaign, and whether the campaign was selected by Kickstarter to be featured on the website. The presence of videos, the number of images, and presence of misspellings—all factors that previous researchers have proven influence the likelihood of funding success—were also controlled.⁷⁴

The results of the logistic regression are reported below in Table 3. Model 1 focuses on the size of the campaign goal, whether the campaign described the campaign's product as already patented or had a patent pending, and whether the campaign is U.S.-based and in U.S. currency. Model 2 introduces controls for duration and whether Kickstarter picked the campaign to be featured and fixed effects for the technology categories, year listed, and geography.⁷⁵ Model 3 introduces controls for the presence of videos and the number of images. Finally, Model 4 introduces controls focused on the campaign description, including the number of words, whether there are misspellings, and if there are “novelty” words present in the description.

The novelty language identified included terms, and their synonyms, that suggested the campaign was new, innovative, or creative, similar to that used by Yang et al. when studying the support for innovative campaigns on Kickstarter.⁷⁶

72. If a campaign included both patented and pending patents, the campaign was counted in both categories.

73. Mollick, *supra* note 5.

74. *Id.* at 7–8 (discussing the factors that lead to successful fundraising).

75. *See id.* at 7 (discussing that for his research, Mollick “controlled for the log of the goal of the project, project category, fundraising duration, and whether the project was featured by Kickstarter on their home page”).

76. Anirban Mukherjee, Cathy L. Yang, Ping Xiao & Amitava Chattopadhyay, *Does the Crowd Support Innovation? Innovation Claims and Success on Kickstarter* 3–4, (HEC PARIS, Working Paper No. MKG-2017-

The reason such language was isolated was to control for situations where the campaign’s creator, or at least backers, believed the campaign to be patent-eligible—being new and innovative—even if no patent was filed or issued.

TABLE 3: PREDICTORS OF PROJECT SUCCESS

	(1)	(2)	(3)	(4)
LOG(GOAL)	0.708*** (0.0102)	0.586*** (0.0106)	0.484*** (0.0105)	0.480*** (0.0104)
PATENTED	1.35 (0.164)	1.11 (0.150)	1.01 (0.146)	0.985 (0.143)
PATENT-PENDING	1.581*** (0.135)	1.360** (0.131)	1.312** (0.133)	1.285* (0.130)
US BASED	1.105 (0.052)	1.144** (0.068)	1.144** (0.071)	1.142** (0.071)
US CURRENCY	1.24*** (0.064)	1.318** (0.079)	1.395*** (0.088)	1.401*** (0.089)
DURATION		1.00 (0.002)	1.00 (0.002)	1.00 (0.002)
STAFF PICK		13.66*** (1.179)	10.74*** (0.963)	10.63*** (0.955)
VIDEO			2.90*** (0.264)	2.77*** (0.254)
# OF IMAGES			1.04*** (0.003)	1.05*** (0.003)
WORD COUNT				1.00 (0.000)
SPELLING ERROR				1.118 (0.087)
NOVELTY LANGUAGE				1.348*** (0.087)
CATEGORY CONTROLS		Yes	Yes	Yes
YEAR CONTROLS		Yes	No	No
US CITY CONTROLS		Yes	Yes	Yes
N	9,184	9,184	9,184	9,184
ODDS RATIO COEFFICIENTS; STANDARD ERRORS IN PARENTHESES				

* P<0.05 ** P<0.01 *** P<0.001

The models confirm previous crowdfunding study results showing that the larger the campaign goal, the less likely the campaign will be successful.⁷⁷ In contrast, the presence of videos and images increase the odds of success, in line with previous findings.⁷⁸ And being selected by Kickstarter increases the odds

1220, 2017) (“For example, several English dictionaries define ‘creative,’ ‘innovative,’ ‘novelty,’ and ‘originality’ to be synonyms. However, for product innovation, novelty and originality are not sufficient . . . Therefore, we focus on the extent of novelty and usefulness claims in the description on the project webpage to measure innovativeness, and relate these measures to funding outcomes.”).

77. See Mollick, *supra* note 5, at 5 (“While many factors influence project goal, there is a strong incentive for individuals to select realistic project goals, since raising too little capital may result in project non-delivery, and high project goals likely make projects less likely to succeed.”).

78. See *id.* at 8 (“There are few things more important to creating a quality Kickstarter project than a pitch video” (quoting *Tips for Making Your Project Video*, KICKSTARTER BLOG (June 29, 2011), <https://www.kickstarter.com/blog/tips-for-making-a-project-video> [<https://perma.cc/V5K7-URJ4>])).

of success tremendously—twelve times. The Technology subcategory and origination from specific geographic locations also statistically influences the odds of success.

Regarding patented campaigns, there is no statistical significance under any model. The odds-ratio for patented campaigns in Model 1 are slightly above 1.0—suggesting that patents help success. However, in the more detailed models, being patented shows essentially no influence on success.

The patent-pending results tell a different story. The results are statistically significant and increase the odds of success across all models. Under the most detailed model—Model 4—campaigns with patent applications pending are about 36% more likely to be successful compared to those without.

These results held true even when controlling for the described novelty of the campaign. This means that even when a campaign was identified, and likely perceived, as novel or innovative, having a patent pending would increase success, while getting the patent provided no significant effect. This control also tries to remove the selection effect of a campaign being patent-eligible, but the campaign creator not filing for or obtaining a patent. The control is not perfect because mere identification as novel or innovative does not mean the project is patent eligible.

Thus, patented campaigns are not statistically correlated with more crowdfunding success. However, campaigns with patent applications pending are more successful. The patent-pending results fit with the MTurk survey results that indicate some are more likely to buy or invest in a product if it is listed as patent-pending. But these MTurk survey results indicate a stronger likelihood to buy and invest in patented products, but this does not show up in the Kickstarter campaign results.

There are limitations in this analysis, such as selection effects both as to what patented or patent-pending projects are being observed in these live Kickstarter campaigns and the “investors” who are “investing” in these patented or patent-pending projects. An attempt to remove this effect was made by controlling for the “novelty language” used in the campaign description. By controlling for the presence of such language, campaigns presented as “new,” (and thus possibly perceived as patent-eligible) but did not indicate a “patented” or “patent-pending” status were identified.

There are also questions about whether the potential backers even recognize the patent status identified. The assumption is that the patent status is recognized by individuals who are thinking about backing the campaign. This assumption is based on the patent signal theory literature indicating that buyers and investors care about patent status—and thus would notice it.

This all being said, the results here only partially line up with the general responses from the MTurkers. Even though some scholars indicate that Kickstarter backers view themselves as investors, the better comparison is viewing them like buyers. And as detailed in Table 1 above, most respondents view the fact that a product is patented as having no effect on their decision to buy. And in the live data, those results come true with the patented campaigns not being

more successful than other campaigns. Table 1, however, indicates that an even lesser effect should be observed for patent-pending campaigns, but this is not the case. Patent-pending campaigns are statistically correlated with more success, not less. The fact that the observed behavior does not completely fit with either patent theory or the general sentiment of potential backers warrants further investigation. This further investigation takes place below when looking at the mock Kickstarter scenarios on MTurk.

2. *MTurk Scenarios*

The MTurk scenarios provide an opportunity to test the results of the field observation by providing the exact same campaign—headphones or flip-flops—while only varying, randomly, the patent-status identified to the potential funder. The MTurk environment also allows asking respondents whether they recognized the patent status and remembered it.

To answer this latter question, the survey asks respondents what the patent status of the campaign was. In the field observations, it was assumed that potential funders recognized the identified patent status, but this study was unable to test whether that was true. The question could be asked of MTurkers and only a slight majority correctly remembered the campaign’s patent status—with the specific results reproduced below in Table 4.

TABLE 4: RECOGNITION OF PATENT STATUS BY MTURKERS

	Headphones (n=751)	Flip-flops (n=758)	Overall (n=1,509)
Recognized Correctly	56.7% (426)	50.8% (385)	53.7% (811)
Recognized patent, but got status wrong	61.3% (460)	53.8% (408)	57.5% (868)
Admitted not noticing patent status	23% (174)	27% (205)	25% (379)

The data shows that the patent status most incorrectly identified was “patented,” with only 37% (188 of 508) identifying this status correctly. In comparison, “patent-pending” was correctly identified by 63.17%—319 out of 505—respondents and no patent identification correctly identified by 61.3%—304 out of 496—respondents. This result did not get much better when looking just at whether the identification of “patent” was correct (that the respondents remembered correctly that the campaign said something about being patented or patent-pending), with still less than half (44.7%—227 of 508) of the “patented” campaigns being misidentified. Those respondents who knew what it means for a product to be patented were 1.8 times more likely to recognize the patent status of the campaign correctly.

Respondents were more likely to recognize patent-pending or no patent campaigns as compared to patented ones. And still, roughly 40% of the respondents were incorrect about the campaign's patent status. This provides some insight into the live campaign results, meaning that potential backers are (1) more likely to notice and remember the "patent-pending" status as compared to "patented" status and (2) a large portion of potential backers will miss the patent status altogether.

Below is a logistic regression to determine whether patent-status was correlated with various responses to the questions regarding likelihood to buy, invest, or recommend a product and regarding how innovative and well-made the product is. In these regressions, a number of controls were introduced, including whether the respondent recognized the campaign's patent status correctly. These results are set forth below in Table 5.

TABLE 5: PATENT STATUS'S IMPACT ON MTURKERS' DECISIONS
(BASE= "NO EFFECT")

	LIKELY BUY	LIKELY INVEST	INNOVATIVE	WELL-MADE	LIKELY RECOMMEND
<i>EXTREMELY</i>					
PATENTED	0.533 (0.369)	-0.224 (0.429)	-0.409 (0.264)	0.0439 (0.297)	0.0284 (0.309)
PATENT-PENDING	0.864* (0.350)	0.493 (0.395)	-0.317 (0.259)	0.346 (0.286)	0.333 (0.298)
HEADPHONES	0.553 (0.297)	0.377 (0.348)	0.389 (0.215)	-0.295 (0.266)	0.119 (0.256)
<i>VERY</i>					
PATENTED	0.0130 (0.221)	-0.0325 (0.264)	-0.324 (0.179)	0.126 (0.171)	0.0238 (0.215)
PATENT-PENDING	0.0671 (0.220)	-0.0885 (0.268)	-0.216 (0.178)	0.220 (0.169)	0.204 (0.214)
HEADPHONES	0.0832 (0.183)	-0.188 (0.220)	-0.168 (0.143)	-1.403*** (0.151)	-0.136 (0.179)
<i>MODERATELY</i>					
PATENTED	-0.0396 (0.222)	0.0710 (0.246)	-0.388 (0.327)	-0.106 (0.324)	0.317 (0.221)
PATENT-PENDING	0.187 (0.218)	0.0957 (0.247)	-0.00256 (0.316)	-0.00694 (0.314)	0.428 (0.220)
HEADPHONES	-1.218*** (0.183)	-0.964*** (0.203)	-0.317 (0.259)	-3.556*** (0.395)	-1.319*** (0.184)
<i>SLIGHTLY</i>					

PATENTED	0.210 (0.218)	-0.123 (0.254)	-0.310 (0.185)	0.0978 (0.204)	0.273 (0.208)
PATENT-PENDING	0.128 (0.219)	0.0159 (0.253)	-0.159 (0.183)	0.153 (0.202)	0.344 (0.208)
HEADPHONES	-0.369* (0.179)	-0.220 (0.210)	-0.210 (0.147)	-2.431*** (0.180)	-0.577*** (0.172)
<i>CONTROLS</i>					
RECOGNIZED PATENT STATUS CORRECTLY	NO	NO	YES	NO	YES
CROWDFUNDED BEFORE	YES	NO	NO	NO	NO
CREATED CROWDFUNDING	YES	YES	YES	YES	YES
HEARD OF KICKSTARTER	YES	YES	YES	YES	YES
USED KICKSTARTER	NO	YES	NO	NO	NO
RACE	YES	NO	NO	NO	NO
ENGLISH PRIMARY LANGUAGE	YES	NO	YES	YES	YES
POLITICS	NO	NO	NO	NO	NO
EDUCATION	YES	NO	NO	NO	YES
EMPLOYMENT	YES	YES	NO	YES	YES
GENDER	NO	NO	YES	YES	NO
AGE	YES	YES	YES	NO	YES
INCOME	NO	NO	NO	NO	NO

Patent status did not have any statistically significant effect except for the likelihood to buy the product listed in the campaign. Respondents, controlling for a multitude of other independent variables, were more likely to have a strong preference (“extremely likely”) to buy the patent-pending product. The respondents were indifferent to the “patented” status campaigns across the board.

These results are similar to those observed in the live Kickstarter campaigns above. Campaigns with a patented status had no statistically significant relationship with any increased preference for buying, investing, or recommending. This result is similar to the lack of significance seen with the success of patented live Kickstarter campaigns. In contrast, patent-pending live Kickstarter campaigns were more likely to be successful—a result that coincides with the MTurk finding that respondents were extremely likely to buy a patent-pending campaign. And this strong preference to buy the patent-pending campaign stays significant and positive when introducing as a control the respondent’s general preference for buying patent-pending products. Put another way, even those respondents that, in general, did not indicate a strong preference to buy a patent-pending product exhibited one when such a choice was presented.

The MTurk findings confirmation of the live Kickstarter observations validate the overall results. Campaigns that say they are patent-pending appear to have an advantage in the Kickstarter environment—making it more likely for backers to pre-buy the campaign and the campaign to be ultimately successful. This result holds true across both environments, even though it runs contrary to the general sentiment of indifference to patent-pending and buying decisions seen in Table 1. And, in contrast, in both studies, patented status has no effect on a potential backer’s decision.

Another point worth reemphasizing is that one cannot assume that a potential backer notices, much less remembers, the patent status of the campaign. Even with a simple campaign—a single picture showing in Figures 1–4, many respondents, at least 40%, could not correctly remember if the campaign even mentions patents, let alone patented versus patent-pending. And this lack of remembrance is more pronounced with a patented status, perhaps due to the longer phrasing and additional hyphen of “patent-pending” versus “patented.”⁷⁹

C. *Patents and Crowdfunding Delivery and Delivery-Delay*

Another aspect of patent theory that can be examined with crowdfunding is whether being patented helps a product actually come to market—be commercialized.⁸⁰ In the crowdfunding context, this can be tested to see whether a successful campaign delivers its promised product. The speed of delivery—particularly whether delivery is delayed—can also be tested in the crowdfunding context.

To do this, a random sample of 374 campaigns in two patent-heavy Technology subcategories—Hardware and Gadgets—that promised delivery by December 2016 were further studied. Specifically, delivery and timing of delivery of the campaign’s promised product were examined. Kickstarter campaigns identify delivery targets—both what is going to be delivered and when—at the beginning of the campaign.⁸¹ But Kickstarter does not expressly update the campaign page beyond identifying whether the project was funded or not.⁸² Thus, getting delivery and delivery date information required reading the campaign and

79. See Boris New, Ludovic Ferrand, Christophe Pallier & Marc Brysbaert, *Reexamining the Word Length Effect in Visual Word Recognition: New Evidence from the English Lexicon Project*, 13 *PSYCHONOMIC BULL. & REV.* 45, 51 (2006) (discussing findings that suggest syllable length may have an inhibitory effect in lexical decision tasks); Henry L. Roediger & Kathleen B. McDermott, *Creating False Memories: Remembering Words Not Presented in Lists*, 21 *J. EXPERIMENTAL PSYCH.: LEARNING, MEMORY, & COGNITION* 803, 808–12 (1995) (discussing results on subject recall of word lists containing words of various lengths).

80. See generally Sichelman, *supra* note 2 (examining the patent system’s effect on the commercialization of products).

81. See Julianne Pepitone, *Why 84% of Kickstarter’s Top Projects Shipped Late*, *CNN BUS.* (Dec. 18, 2012, 8:04 AM) (“Creators describe their project, set a fundraising goal, and announce their target shipping date.”).

82. *Can a Project Be Edited After Launching?*, *KICKSTARTER*, <https://help.kickstarter.com/hc/en-us/articles/115005135314-Can-a-project-be-edited-after-launching> [<https://perma.cc/LP9K-ZTLQ>] (Nov. 17, 2020) (“If your project is still live, there are a few areas that you can continue to make changes to. However, please keep in mind that when the funding period ends these areas will be locked from any further edits.”).

accompanying comments and updates and, in some cases, exploring other information regarding the subject product available on the Internet.

Campaigns with no patent delivered in 210 of 256 successful campaigns (82%). Patent-pending campaigns fared better, delivering on 86.2% of the campaigns (seventy-five of eighty-seven). In contrast, patented campaigns showed a much lower delivery rate of 70.3% (twenty-six of thirty-seven). Notably, none of these results were statistically significant.

A logistic regression of the odds of successful delivery was performed to further explore the relationship between patents and delivery. The results are shown in Table 5 below. Model 1 just focused on the goal amount and how that influenced delivery. Model 2 introduced the patented and patent-pending variable as well as controls for the Technology subcategory. Model 3 introduced the presence of novelty language in the campaign, capturing campaigns that might be harder to deliver regardless of patent status. Model 3 also included a log of the percent funded and the number of backers to control for possible overload and overfunding that could delay or completely prohibit whether delivery is met.

TABLE 6: DELIVERY OF PROMISED PRODUCT.

	(1)	(2)	(3)
LOG(GOAL)	0.750*	0.752	0.645*
	(0.110)	(0.112)	(0.118)
US BASED	1.3161	1.244	1.231
	(0.684)	(0.463)	(0.462)
PATENTED		0.919	0.953
		(0.479)	(0.499)
PATENT-PENDING		1.940	1.951
		(0.904)	(0.914)
NOVELTY LANGUAGE			1.158
			(0.498)
LOG (PERCENT FUNDED)			0.773
			(0.209)
TOTAL BACKERS			1.000
			(0.000)
CATEGORY CONTROL	NO	NO	NO
N	374	374	374
EXPONENTIATED COEFFICIENTS; STANDARD ERRORS IN PARENTHESES			
* P<0.05 ** P<0.01 ***P<0.001			

Notably, nothing is statistically significant. The odds ratios for the log of the goal is predictable, with a higher goal associated with lower odds of delivery—presumably because expensive campaigns are just harder to actually produce and deliver. Those campaigns likely involve more complex and expensive products. The log of the percent funded exhibits a similar, less than one odds ratio. The total number of backers does not show any difference in chance of delivery. Delivery appears not to be dependent on the volume of products being delivered, but rather if the product can actually be produced in the first place.

With regards to patents, again, nothing is statistically significant. The odds ratios do follow from the descriptors set forth above. Patented campaigns exhibit

lower odds of delivery and patent-pending campaigns higher odds. And the novelty (or at least perceived novelty) of the campaign, identified by the language in the description, had no effect on delivery success.

The positive correlation between delivery and patenting, posited by patent theory,⁸³ is not observed. No clear relationship between the two is observed. This result, particularly the lack of statistical significance, could be due to the number of observations investigated. But the magnitudes do not look promising, with patented campaigns delivering at a lower rate. Patent theory would suggest higher delivery—with patents facilitating commercialization.⁸⁴

Another aspect of delivery that can be tested is whether the campaign meets its delivery time goal. A campaign will set delivery dates for the campaign's product.⁸⁵ And thus, the delay, if any, of reaching delivery can be observed. This delay is determined by looking at comments and updates on those campaigns that did deliver.⁸⁶ Most campaigns exhibited some delay in delivering the promised product, falling in line with entrepreneurs being overly optimistic and over promising, particularly with timelines.

To determine the rate at which delays occur, and the potential causes of delays, a Cox proportional hazard model was used to predict the degree of delay for the random sample. Figures 5 and 6 below show the Kaplan-Meier curve showing cumulative delay separated by the presence of patents and pending patent applications. Figure 6 focuses solely on projects with goals of \$50,000 or more.

83. Sichelman, *supra* note 2.

84. *Id.*

85. *What Does Estimated Delivery Date Mean?*, KICKSTARTER (Nov. 17, 2020), <https://help.kickstarter.com/hc/en-us/articles/115005134193-What-does-estimated-delivery-date-mean> [<https://perma.cc/3R3K-7Z5E>].

86. *See e.g.*, Oculus, *Update on Oculus Technology, Shipping Details*, KICKSTARTER (Nov. 28, 2012), <https://www.kickstarter.com/projects/1523379957/oculus-rift-step-into-the-game/posts/357600> [<https://perma.cc/LW7S-QULQ>].

FIGURE 5: KAPLAN-MEIER CURVE (ALL CAMPAIGNS)

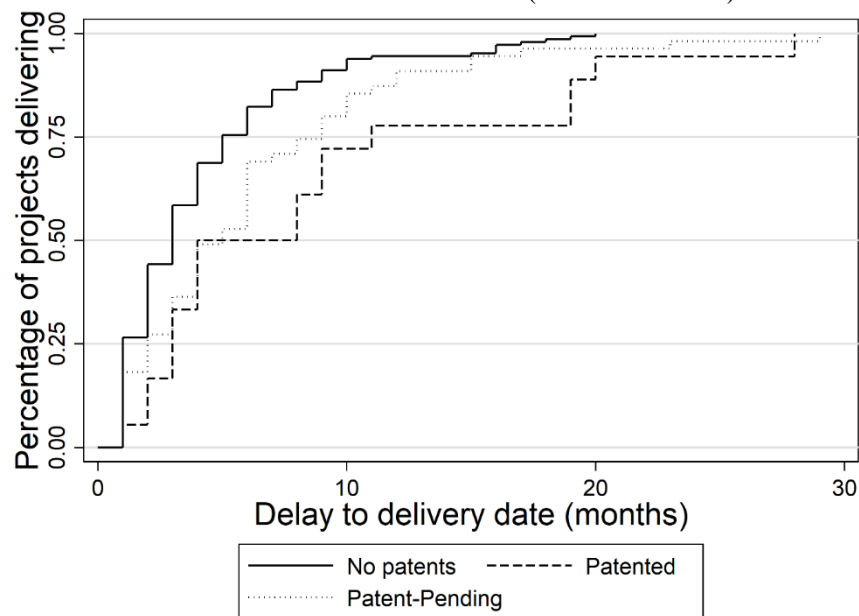
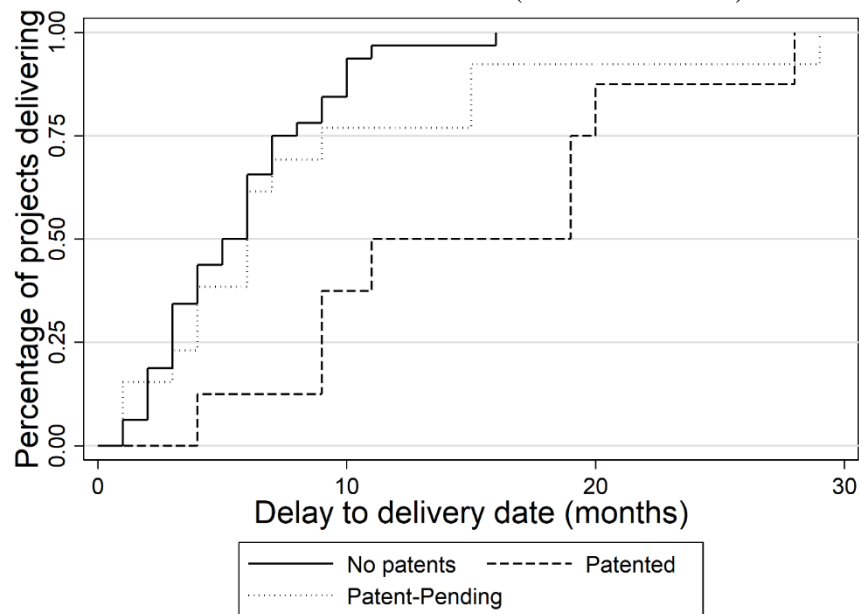


FIGURE 6: KAPLAN-MEIER CURVE (CAMPAIGNS > 50K)



Both patent-pending and patented campaigns experience greater delays in comparison to campaigns with no patents. The patented campaigns, however, show much greater delays, which become more pronounced when looking at

projects over \$50,000. And, interestingly, when looking at high-value projects, patent-pending campaigns and no patent campaigns exhibit slightly similar delays (absent the long tail with patent-pending campaigns).

The results of this Cox model are shown in Table 7 below.

TABLE 7: COX MODEL FOR DELIVERY DELAY

	(1)	(2)	(3)
LOG(GOAL)	-0.295*** (0.0626)	-0.293*** (0.0640)	-0.311*** (0.066)
US BASED	0.049 (0.1569)	0.015 (0.1579)	0.011 (0.1586)
PATENTED		-0.471* (0.2327)	-0.550* (0.2367)
PATENT-PENDING		-0.399* (0.1622)	-0.441** (0.1635)
NOVELTY LANGUAGE			-0.182 (0.1778)
LOG (PERCENT FUNDED)			-0.152 (0.0917)
TOTAL BACKERS			0 (0.000)
CATEGORY CONTROL	-0.0874 (0.1415)	-0.0292 (0.1423)	-0.0254 (0.142)
N	220	220	220
EXPONENTIATED COEFFICIENTS; STANDARD ERRORS IN PARENTHESES			
* P<0.05 ** P<0.01 ***P<0.001			

In Model 1, the size of the campaign’s goal was controlled, in addition to controlling for the campaign’s subcategory. In Model 2, controls for patented and patent-pending were introduced. Model 3 includes controls for the perceived novelty of the campaign, the percent funded for the campaign, and the total number of backers.

The length of the campaign's goal does correlate with increased delay, confirming previous studies' findings.⁸⁷ Overfunding, however, perceived novelty, the number of backers, and the Technology subcategory were not statistically significant.

The presence of patents, either patented or patent-pending, corresponded with a statistically significant increase in delay. This reproduces what is seen in the Kaplan-Meier curves in Figures 5 and 6 above. This is likely due to the complexity of the patented product. But patent theory would suggest that the patent's presence helps commercialization,⁸⁸ and these results suggest the opposite.

V. CONCLUDING DISCUSSION

A. *No Effect from Patented Status*

The lack of correlation between patented campaigns and success is surprising at first blush. Theory suggests that labeling a campaign as patented signals high quality and would attract investors and buyers.⁸⁹ But, particularly based on the MTurk results, potential backers were most likely to completely miss the fact that a campaign is labeled as patented. So even if a possible investor/buyer believes she cares about the product being patented, the study's results indicate that the patent status most missed is whether it is patented. Patented status is likely having little to no effect in both the MTurk and live study because many backers are simply missing that the campaign is labeled as patented.

The reason they are missing this labeling could be due to the fact that, as evidenced in the MTurk data, many indicated that a patented status has no effect on their decision to buy a product. And while they indicated there was a positive relationship between patented and investing, the percentage that said they were more likely to invest was barely over 60%. Even if the patented status is noticed, its strength to prompt buying or investing is not as strong as patent theory suggests.

This lack of recognition may also be evidence that a patented status, in the context of crowdfunding, is low on the scale of salient factors crowdfunding backers are concerned. That is, these results are driven by the poor fit between patenting and crowdfunding. First, patented campaigns are, by definition, campaigns involving innovations that are likely older than other campaigns on crowdfunding sites, and particularly older when compared to patent-pending campaigns. The patenting process typically takes at 2.5 years.⁹⁰ Thus, the age of the technology, not the fact that they are patented, may make the campaigns less appealing to crowdfunders. These campaigns do not fit within the start-up, very

87. Mollick, *supra* note 5, at 12–13 (finding “strong evidence that project size and the increased expectations around highly popular projects are related to delays” noting that “larger projects suffer longer delays than smaller projects” and “the degree to which projects are overfunded also predicts delays. Projects that are funded at 10x their goal are half as likely to deliver at a given time, compared to projects funded at their goal.”).

88. Sichelman, *supra* note 2.

89. See Long, *supra* note 3, at 636.

90. USPTO, *supra* note 14, at 49 tbl.5.

early development environment common in crowdfunding. Second, patenting is resource intensive and typically associated with more complex innovators who typically pursue more sophisticated and traditional means of funding, such as venture capital.⁹¹ Therefore, for patented campaigns, crowdfunding is likely not the first option for securing funding. The patented campaigns that appear on Kickstarter may have already been passed over by these traditional funders meaning that, via this filter, the less desirable and less organized patented projects are showing up on crowdfunding websites. Those patentholders that turn to crowdfunding have either already failed to get funding from other sources or are not acting rationally, both of which suggest that either the campaign or the campaigner are of low quality. And the lack of success and delay in delivery bear that out. Third, patented inventions, by definition being new and nonobvious, are likely more complex than non-patented ones, and thus are harder to actually make.⁹² Contributors either recognize this fact, and do not fund these projects, or experience the results of these facts via lower delivery rates and higher delivery delays. As observed in the live Kickstarter campaigns, patented campaigns correlated with the lower delivery rates and greater delivery delays.

These results fall in line with, and further support, previous research findings of no effect of patented status in the crowdfunding context.⁹³ As mentioned, Gerrit Ahlers, Douglas Cumming, Christina Günther, and Denis Schweizer studied the characteristics of successful equity crowdfunding campaigns and found, in part, that patenting has little to no impact on the success of equity financing.⁹⁴ The results observed here both in the field and in the laboratory fall in line with these previous results. Azzurra Meoli, Federico Munari, and James Bort even concluded that patented status has a negative effect on crowdfunding success.⁹⁵ The convergence of all of these studies with the same results regarding a patented status for crowdfunding campaign seriously calls into question the signaling theory positive effect in this context.

B. *Positive Success Effect for Patent-Pending Status*

The data tells a different story for the patent-pending status campaigns, which do correlate with a higher rate of success and higher likelihood to be purchased. The MTurk data indicates that while patent-pending status has a lower positive influence on purchase when compared to a patented status, the potential backer is more likely to recognize and remember this patent status. Thus, the

91. Jonathan S. Masur & Adam K. Mortara, *Patents, Property, and Prospectivity*, 71 STAN. L. REV. 963, 966 (2019) (“Patents exist for the purpose of promoting innovation, and they do so by granting legal rights to innovators that allow them to capture significant financial returns by making and selling their inventions.”).

92. 35 U.S.C. § 103; Cotropia, *supra* note 1, at 1871 (“For an invention to gain patent protection, the invention must meet certain patentability standards—namely, the invention must be novel, nonobvious, and useful.”).

93. Christopher A. Cotropia, *Crowdfunding and Patents*, UNIV. CAL., BERKELEY SCH. L. (July 25, 2018), <https://www.law.berkeley.edu/wp-content/uploads/2018/08/Christopher-Cotropia-Paper.pdf> [<https://perma.cc/E9TJ-YJQR>].

94. See Ahlers et al., *supra* note 56, 955.

95. Meoili et al., *supra* note 55, at 1321.

increase in noticing the patent-pending status allows the signal to have an effect—even if it is less than patented, this status is more likely to be noticed.

The patent-pending status's positive correlation—both in the live and mock Kickstarter campaigns—with success could be explained by the fact that patent-pending, as opposed to patented, necessarily means the technology is newer, producing the opposite implications of those discussed above regarding patented campaigns.⁹⁶ And the positive signal of a patent-pending, as opposed to no patent at all, increases the likelihood of success for the reasons articulated in traditional patent theory of commercialization and signaling recited above.⁹⁷ The early timing of these campaigns also means that they are less likely to have been filtered through other funding mechanisms. The early stage of these campaigns may also fit better with the crowdfunding environment and culture. And the exhibited delivery delay is supported by patent-pending campaigns being more complex than the average, no patent campaign.⁹⁸

The results show that patents are not always a net plus for innovators and those who invest in the innovations. But merely applying for a patent may have greater benefits than previously articulated. The data shows that patent signaling and commercialization theory is nuanced when playing out in practice—here in the crowdfunding environment. There is the initial real question of whether an investor or buyer even notices the patent status labeling. The other factor to consider is the timing of the patent status identified—whether just filed (patent-pending) or ultimately (patented)—and what this information means to a potential investor or buyer.

This finding is important for the patent signals literature. Most of the current discussion focuses on whether the product is patented and not on whether it merely has a patent-pending.⁹⁹ This study suggests that such a patent status designation does matter. Merely having a patent application on file, and advertising that fact, could lead to more buyers and more investors. The patent as signals story should consider patent-pending signals, not just patented ones, and make sure to distinguish the signals being sent by one as compared to the other.

96. Lemley & Sampat, *supra* note 12.

97. Sichelman, *supra* note 2, at 377 (“[T]he patent system . . . serve[s] . . . important goals, such as the disclosure of new and non-obvious information, the signaling of technological capability within and outside firms, and the reduction of transaction costs in business dealings.”); Long, *supra* note 3, at 637 (“[P]atents can serve as a signal of . . . quality. . . . If observers in capital markets believe that patents convey significant information about a firm that makes the firm a more attractive investment opportunity, firms may choose to experience losses in product markets in order to capture gains in capital markets.”).

98. 35 U.S.C. § 103 (2018); Cotropia, *supra* note 1; Cotropia, *supra* note 23, at 84 (discussing the benefits of early filing on the ability of patent owners to encourage companies to invest in early-stage investment).

99. See, e.g., Long, *supra* note 3.

C. Implications for Patent Marking Law

The patent-pending positive effect and non-effect for patented labeling may also warrant reconsidering the patent marking laws.¹⁰⁰ Such labeling is encouraged by the patent system by providing greater damages and expanding liability, particularly to indirect infringers.¹⁰¹ And mislabeling can lead to damages with section 292(a) stating, in relevant part, that

[w]hoever marks upon, or affixes to, or uses in advertising in connection with any unpatented article, the word ‘patent’ or any word or number importing that the same is patented for the purpose of deceiving the public . . . [s]hall be fined not more than \$500 for every such offense.¹⁰²

The assumption behind these statutes is that labeling should be encouraged for the benefits of other innovators but also consumers.¹⁰³

The data from this study, particularly when combined with previous studies, discounts the importance of a patented marking, and perhaps the extent of negative consumer effects from mis-marking. Consumers, based on this study’s findings, rarely even recognize whether the product is patented or not—suggesting that marking is ignored. And when they do recognize, marking a product as patented may not be as relevant to a consumer’s decision as once believed.

In contrast, the labeling of patent-pending is important, and the marking law should reflect this importance. Consumers are more likely to recognize such a marking, and such labeling does correlate to a change in consumer behavior. Accordingly, a previous proposal by Grant to strengthen the standards for determining false marking of patent-pending should be seriously considered.¹⁰⁴ This type of marking has an effect, a larger effect than previously thought. The law should reflect this fact.

100. Thomas F. Cotter, *Optimal Fines for False Patent Marking*, 17 MICH. TELECOMM. & TECH. L. REV. 181, 181, 189–97 (2010) (explaining the current patent marking laws and suggesting a new framework for imposing rational fines for false patent marking).

101. See 35 U.S.C. § 292(a) (2018); 7 DONALD S. CHISUM, CHISUM ON PATENTS § 20.03[7][c][vii] (2018) (noting that false marking may “create a misleading impression that the product is technologically superior to previously available ones”).

102. 35 U.S.C. § 292(a).

103. CHISUM, *supra* note 101 (noting that a patent label could indicate superiority over a previously available product).

104. Bonnie Grant, *Deficiencies and Proposed Recommendations to the False Marking Statute: Controlling Use of the Term Patent Pending*, 12 J. INTELL. PROP. L. 283, 283 (2004) (noting that the “current [patent marking] statute is insufficient” because it does not contain guidelines appropriate for the use of the term “patent pending”).

