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Christopher Sprigman
Christopher Buccafusco



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The Creativity Effect

Christopher Buccafusco[†] & Christopher Jon Sprigman^{††}

This Article reports the first experiment to demonstrate the existence of a valuation anomaly associated with the creation of new works. To date, a wealth of social science research has shown that the least amount of money that owners of goods are willing to accept to part with their possessions is often far greater than the amount that purchasers would be willing to pay to obtain them. This phenomenon, known as the endowment effect, may create substantial inefficiencies in many markets. Our experiment demonstrates the existence of a related “creativity effect.” We show that creators of works value their creations substantially more than do both potential purchasers of their works and mere owners of the works. The creators in our study valued their works (in this case, paintings) more than four times higher than potential buyers did and almost twice as high as did owners of the works. Further, we provide evidence that these differences are the result of creators’ irrational optimism about the quality of their works. We conclude by discussing the implications of these findings for intellectual property (IP) theory in general and IP licensing in particular. Our findings challenge the classical economic approach to IP rights, and they suggest that IP markets may be less efficient than previously recognized.

INTRODUCTION

In this Article, we report on the second installment in a planned series of experiments designed to determine whether transactions in intellectual property (IP) are subject to the valuation anomaly commonly referred to as the “endowment effect”—the empirical finding that owners of goods tend to value them substantially more than do purchasers. In previous work, we conducted experiments that demonstrated a substantial valuation asymmetry between authors of poems

[†] Assistant Professor, Chicago-Kent College of Law.

^{††} Professor, University of Virginia School of Law.

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and potential purchasers of them.¹ Our previous article was the first to show that the endowment effect attended transactions in goods that were (1) actually *created* by the owners, and (2) *nonrival* (that is, goods for which consumption by one person does not prevent consumption by another).² In this Article, we extend our previous work and report the results of an experiment suggesting that transactions in IP are also subject to a separate *creativity effect*—a valuation anomaly, distinct from mere endowment effects, that may affect the way in which the originators of creative works assign value to their creations. This creativity effect further enlarges the gap that endowment effects already create between the price at which creators are willing to transfer their work and the price that buyers are willing to pay. Our latest experiment thus suggests that markets for the licensing and transfer of IP may be subject to special inefficiencies above and beyond those imposed by the endowment effect generally. As a result, IP law's current structure, which relies heavily on property rules (that is, rights to exclude) rather than liability rules (that is, rights to compensation for use) may create substantial barriers to optimal transacting, suggesting that we may wish to consider shifting IP law's mix of entitlements toward liability rules.

I. VALUING INTELLECTUAL PROPERTY

A. The Endowment Effect and Intellectual Property³

IP law relies heavily on legal rights structured as “property rules”—rules establishing an owner's ability to exclude others—as distinguished from “liability rules,” which permit access to an owner's property but mandate some payment to the rightsholder.⁴ The decision to formulate most IP rules as providing rights to exclude is based in large part on a belief that individuals engaging in market transactions will do a better job relative to government at setting prices for access to IP.⁵ IP law's deeply rooted preference for market

¹ See Christopher Buccafusco and Christopher Sprigman, *Valuing Intellectual Property: An Experiment*, 96 Cornell L Rev 1, 17–31 (2010).

² *Id.* at 4.

³ Part I.A is reproduced substantially from *id.* at 2–6.

⁴ For the canonical formulation of property and liability rules, see Guido Calabresi and A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 Harv L Rev 1089, 1089–93 (1971).

⁵ See Robert P. Merges, *Contracting into Liability Rules: Intellectual Property Rights and Collective Rights Organizations*, 84 Cal L Rev 1293, 1308 (1996) (“[IP] liability rules are set by Congress through compulsory licensing schemes and are not precisely-tailored valuations.”); William M. Landes and Richard A. Posner, *The Economic Structure of Intellectual Property Law* 414 (Belknap 2003) (“Markets and property rights go hand in hand. Property rights provide the

price-setting is based on an even more fundamental presumption that underlies neoclassical economic theory in general—namely, that people act as rational agents who make choices based on their own stable and well-defined preferences.⁶

Over the past few decades, important new research in behavioral psychology and experimental economics has challenged fundamental social-scientific assumptions about individual rationality and the efficient functioning of markets.⁷ The “rational actor” model of classical economics, which assumes that people have stable preferences and make decisions that maximize their utility, is being eroded in favor of a more nuanced and empirically robust view of human decisionmaking as “boundedly rational.”⁸

Perhaps the most important contribution of the behavioral economics research is the discovery that people’s valuations of goods or states of affairs are highly dependent on the way those goods or states of affairs are framed.⁹ Whereas neoclassical economic theory assumes that the value a person attaches to an item is endogenous (that is, based on the person’s internal preferences), a mountain of survey and experimental data has shown that people attach substantially higher value to goods if they own them than if they are considering purchasing them.¹⁰ People are reluctant to part with their property, and the amount that they are willing to accept (WTA) to sell it generally far exceeds the amount that others are willing to pay (WTP) for it. This WTA/WTP gap has been termed the “endowment effect,” and it has been detected for an astounding variety of forms of property.¹¹ The

basic incentives for private economic activity and also the starting point for transactions whereby resources are shifted to their most valuable use.”)

⁶ See Daniel Kahneman, Jack L. Knetsch, and Richard H. Thaler, *Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias*, 5 *J Econ Persp* 193, 193 (1991).

⁷ See Russell B. Korobkin and Thomas S. Ulen, *Law and Behavioral Science: Removing the Rationality Assumption from Law and Economics*, 88 *Cal L Rev* 1051, 1054–58 (2000).

⁸ For a primer on the origins and development of behavioral economics and its incorporation into legal analysis, see generally Cass R. Sunstein, ed, *Behavioral Law and Economics* (Cambridge 2000).

⁹ See Russell B. Korobkin, *The Endowment Effect and Legal Analysis*, 97 *Nw U L Rev* 1227, 1229 (2003); Samuel Issacharoff, *Can There Be a Behavioral Law and Economics?*, 51 *Vand L Rev* 1729, 1735 (1998).

¹⁰ For a review, see Korobkin, 97 *Nw U L Rev* at 1230–42 (cited in note 9).

¹¹ See *id.* at 1232–34 (highlighting research demonstrating the endowment effect’s influence on the valuation of property, ranging from wetlands to candy bars to coffee mugs). As Kathryn Zeiler notes, the use of the term “endowment effect” for the observation of a WTA/WTP gap can create biases of its own, as it imports an explanation of the gap into the description of the behavior—that is, that the valuation gap is due to sellers’ attachment to the good based on their ownership of it. See Kathryn Zeiler, *The Endowment Effect: Implications of Recent Empirical Developments for Legal Theory* *8 n 32 (unpublished manuscript, Jan 2008), online at <http://www.law.umich.edu/centersandprograms/lawandeconomics/workshops/Documents/Winter2008/zeiler.pdf> (visited Oct 15, 2010). We choose to employ the term throughout this Article because it has been widely adopted by most

valuation anomalies caused by the endowment effect threaten to generate considerable inefficiencies in a variety of markets, because initial property distributions will tend to be sticky, thereby impeding efficient transacting. The legal implications of this research have been traced in a number of fields including contract, tort, and property law.¹²

B. Our Prior Research

In previous work, we extended the endowment effect research to the realm of IP by studying goods that were not merely endowed but were instead *created* by our experimental subjects.¹³ Our goal was to create a market that represented the value of IP rights. To that end, we created a contest with a known payout and allowed subjects the opportunity to buy and sell their chances to win the contest.¹⁴ These chances would model the value of IP rights, which is primarily derived from rent-seeking opportunities.¹⁵

The experiment included three randomly assigned groups of subjects: “Authors,” “Owners,” and “Bidders.” The Authors were instructed to write three-line haiku poems for entry into a \$50 contest. They were then given the opportunity to sell their chances to win the prize to another subject—a Bidder—by indicating the least amount of money that they would be willing to accept to give up their chances. The Bidders were each shown a poem and asked to indicate how much money they would be willing to pay to obtain the poem’s chance to win the \$50 prize. Finally, the Owners were told that they owned one of the poems’ chances to win the prize and were asked to indicate the least amount of money that they would be willing to accept to sell it to a Bidder. The subjects were reminded that they were exchanging only the chance to win the prize and not the poem itself.¹⁶

Our first experiment demonstrated a very substantial WTA/WTP gap, which our experimental protocol suggested stemmed from a mix of optimism bias and regret aversion. Our data revealed that Authors valued their work more than twice as high as Bidders (\$20.05 versus \$9.21).¹⁷ The significant differences in valuation that we observed in

commentators on the literature. Importantly, however, we join Zeiler in resisting the temptation to use the “endowment effect” as fully explanatory of the WTA/WTP gap. Instead, our experimental design inquires into the underlying psychological mechanisms that might be motivating the gap.

¹² For a review, see sources cited in Buccafusco and Sprigman, 96 *Cornell L Rev* at 2 nn 3–8 (cited in note 1).

¹³ See *id.* at 19–20.

¹⁴ *Id.*

¹⁵ See Georgios I. Zekos, *Nanotechnology and Biotechnology Patents*, 14 *Intl J L & Info Tech* 310, 363 (2006).

¹⁶ See Buccafusco and Sprigman, 96 *Cornell L Rev* at 19–20 (cited in note 1).

¹⁷ *Id.* at 22.

our initial experiments suggest that “(1) the preferences of IP creators, owners, and purchasers are unstable and dependent on the initial distribution of property rights in creative works, and (2) large gaps arise between WTA and WTP even though the poems are nonrival property and the contemplated alienation of the property is therefore only partial.”¹⁸ Our results further indicate that IP licensing markets may be significantly less efficient than previously believed.¹⁹

Our first set of experiments answered one of our most fundamental questions: our results aligned with our hypothesis that the endowment effect extends to created goods. But the first set of data also produced an unexpected result that suggested this second study. We initially predicted that Authors would exhibit greater valuation biases than Owners—that is, that Authors’ valuations of their works would produce a wider WTA/WTP gap than in the case of mere Owners. We anticipated that Authors would have a greater attachment to the poems they had written than Owners would to poems that had been given to them and that this attachment would result in higher WTA values.

This result failed to materialize—our first set of experiments found no statistically significant differences in valuation between Authors and Owners. Both valued their poems at a level more than twice the WTP of the median Buyer but within the standard range of error of each other. So what happened? One possibility is that the lack of a difference is an artifact of our experimental design. In most real-world settings, creativity is primarily motivated internally by the desire to create (contrary to most economic accounts),²⁰ whereas in our experiment, Authors were told to write their poems and did so without the “spark” of creative motivation.²¹ Additionally, the size of the creative effort in our study was quite small. The five to ten minutes that subjects took to write their three-line poems is not equivalent to the effort that goes into painting a portrait, writing a concerto, or filming a movie. At this level of creativity, we may simply have missed important aspects of real-life authors’ preference functions that might distinguish them from third-party owners.

¹⁸ Id at 4.

¹⁹ See, for example, Alden F. Abbott, *Intellectual Property Licensing and Antitrust Policy: A Comparative Perspective*, 34 L & Pol Intl Bus 801, 803 (2003).

²⁰ See Rebecca Tushnet, *Economies of Desire: Fair Use and Marketplace Assumptions*, 51 Wm & Mary L Rev 513, 521 (2009); Anne Barron, *Copyright Infringement, “Free-Riding” and the Lifeworld*, in Lionel Bently, Jennifer Davis, and Jane C. Ginsburg, eds, *Copyright and Piracy: An Interdisciplinary Critique* 93, 112 (Cambridge 2010).

²¹ Buccafusco and Sprigman, 96 Cornell L Rev at 29 (cited in note 1).

The experiments reported in this Article are designed to determine whether creators who (1) are internally motivated, at least in part, and (2) expend significant creative effort on their works will in fact manifest a significantly larger WTA/WTP gap relative to that produced by transactions involving mere owners. If so, then this would be a distinctive valuation anomaly tied to creative authorship, one which we label the “creativity effect.” We turn now to a description of our experimental protocol.

II. THE EXPERIMENT

In *Valuing Intellectual Property*, we created an informal model for establishing the economic value of IP rights.²² Unlike rights in real or personal property that have value based on individual use and exchange, IP rights primarily derive their value through the statutory monopolies that enable rent-seeking from other users, licensors, and creators. As we argued previously, an IP right’s economic value is based on its owner’s ability to condition use of the underlying work or invention on the payment of fees over some period of time.²³ The value of any particular, individual IP right, then, can be thought of as simply *the probabilistic value of the rents that can be obtained from holding the right to a given work*.²⁴ For example, the ex ante value of a copyright in a newly created work can be estimated by multiplying the amount of money that the copyright holder could obtain through using, selling, or licensing the work in the market by the probability that it will succeed in generating that money.

Of course, creators may value IP rights for reasons beyond mere rent-seeking. They may value the social recognition associated with being awarded a patent, for example. Or the IP right may serve to protect other personal or moral interests that creators have in their works. Although we are interested in these “intrinsic” values, we have decided to bracket them for purposes of this research for two reasons. First, we wanted to create a simple and reliable method for testing economic value and were concerned that other factors would unduly complicate our results. Second, most judicial and academic writing on IP focuses primarily on economic value at the expense of intrinsic value.²⁵

²² See generally *id.* (describing our model and its use in several different experiments).

²³ *Id.* at 17.

²⁴ *Id.* at 17–18.

²⁵ See, for example, Richard A. Posner, *Intellectual Property: The Law and Economics Approach*, 19 J Econ Persp 57, 68–72 (2005); Landes and Posner, *Economic Structure of Intellectual Property Law* at 4–5 (cited in note 5) (“We are skeptical that the noneconomic theories of intellectual property have much explanatory power or normative significance.”). But see Wendy

Accordingly, our initial experimental designs have attempted to isolate the economic value of IP rights.²⁶

A. Method

To model the rent-seeking nature of IP transactions, we established a contest with a payout of known value. As noted above, we hypothesized that our failure to find a difference between creators of works and mere owners of them in our first experiment was based on the small creative endowment associated with haikus. Moreover, the motivation for creating the haikus was purely external. In this experiment, we used student "Painters" who had invested substantially in their works and who were primarily internally motivated to create them. We solicited undergraduate and graduate painting students from the School of the Art Institute of Chicago (SAIC) as subjects. The subjects were invited to choose a medium-sized painting for entry into a contest for a \$100 prize. We received twenty submissions and held two contests of ten paintings each. Each of the Painters was paid \$15 for participating. The contest was hosted in an exhibition space at SAIC, and the paintings were judged by a faculty member at SAIC.

When the Painters arrived at the exhibition space, they mounted their works in two groups of ten. They were then given sheets of paper describing the contest. They were told that they would be competing with the nine other Painters in their group for a \$100 prize based on the quality of the paintings as judged by an expert. They were next told that they would be matched with one of ten additional subjects, known as "Buyers," who would make them a cash offer *for their chance to win the prize*. The Painters were told to indicate the least amount of money that they would be willing to accept to sell their chances to win. If the Buyer's amount was equal to or higher than the amount indicated by the Painter, the Buyer would pay the Painter the amount of the Buyer's offer and receive the chance to win the \$100 prize. If the Buyer's offer did not meet the Painter's WTA price, the Painter would retain her chance to win the prize. Neither party would know the other party's offer before responding. The Painters were reminded in bold that they were not transferring the paintings themselves or any rights in them other than the chance at the prize awarded to the winning painting.

J. Gordon, *A Property Right in Self-Expression: Equality and Individualism in the Natural Law of Intellectual Property*, 102 Yale L J 1533, 1540-75 (1993).

²⁶ We are currently modifying the experiment to evaluate the way creators may derive value from attribution and publication in addition to licensing and rent-seeking.

After viewing all ten paintings and indicating the lowest amount that they would be willing to accept, each Painter answered some additional questions about her painting. She was asked to estimate the probability that her painting would be chosen as the winner, the quality of the painting, the number of hours she spent on the work, the amount of personal or emotional attachment she felt toward the work,²⁷ and the amount of regret she would feel if she sold the painting's chance and it won in another's hands.²⁸

In addition to the Painters, we recruited forty students from Chicago-Kent College of Law to be subjects in the experiment. As these subjects arrived, they were randomly assigned to the role of either Buyer or Owner. They were each paid \$15 for participating. Each Buyer was told that she would be matched with one of ten Painters who had entered paintings into a \$100 contest. The Buyer would be able to make an offer to purchase the Painter's chance to win the prize. She was told to indicate the most she would be willing to pay to buy the Painter's chance to win. After viewing the paintings and indicating a WTP amount, the Buyers were asked the same questions about probability, quality, and regret.²⁹

The Owners were placed in a similar position to the Painters with respect to the contest. They were told that ten paintings had been entered into a contest for \$100 and that each had been assigned to be the owner of one of the paintings. If "her" painting were chosen as the winner, she would receive \$100.³⁰ The Owners were then told that a Buyer would make them a cash offer for their chance to win the prize, and that if the Buyer's offer exceeded the least amount that they would be willing to accept, they would receive the cash offer in exchange for the chance to win. After viewing the paintings and indicating a WTA amount, the Owners were asked the same questions about probability, quality, and regret.

²⁷ This question read, "How would you rate your level of personal and emotional investment or attachment to the painting?" It was followed by a scale from 1 to 10, with 1 labeled "Not at all" and 10 labeled "Very Much."

²⁸ This question read, "Imagine that your painting sells for the amount you indicated and that it goes on to win the prize. How much regret do you anticipate feeling about another person winning with your painting?" It was followed by a scale from 1 to 10, with 1 labeled "Not at all" and 10 labeled "Very Much."

²⁹ The Buyers' question about regret was somewhat different. It read, "Imagine that you fail to purchase the painting for the amount you indicated and that it ends up winning the prize. How much regret do you anticipate feeling?" It was followed by a scale from 1 to 10, with 1 labeled "Not at all" and 10 labeled "Very Much."

³⁰ Our "Owners" were not perfect models of real-world owners. Unlike real owners of IP who presumably own the IP because they purchased it, our owners were simply gifted the chance to win the prize. We hope to study this difference in future experiments.

In order to facilitate administration, we were given permission by the Institutional Review Board to make only the transactions between buyers and sellers that would have affected the distribution of the final prize. No such transactions occurred (Painter and Owner WTA exceeded Buyer WTP), and the winning Painters and Owners were given their prizes.

B. Results

Neoclassical economic theory dictates that our subjects should have assigned values to the paintings by treating them as weighted lottery tickets, with the weights determined by the respective quality of the paintings. Each painting's value could be determined by multiplying its weighted chance to win the prize by the total prize. Thus, if all of the paintings were equally good and equally likely to win the prize, then each painting should have a value of \$10 ($0.1 \times \$100 = \10). Of course, some paintings might be more likely to win than others, and their values should increase proportionately. Importantly, we find that subjects' predictions of their paintings' probabilities of winning significantly predicted their valuations.³¹ This suggests that they understood the task. It does not, however, mean that they always behaved rationally.

Although some paintings might be more likely to win, others would necessarily have to be less likely to win. Thus, because the contest is a zero-sum game, the mean valuation³² of the paintings should remain \$10.³³ This, however, is not what we saw. The Painters' mean WTA was \$74.53, while the Buyers' mean WTP was only \$17.88.³⁴ Also, the Owners' mean WTA was \$40.67. Both the Painters' and Owners' values differed significantly from the Buyers', and, unlike in our

³¹ Assigned value was significantly correlated with probability ($r = .44, p < .01$). Additionally, in ANCOVA analysis with role as a fixed factor and quality, regret, and predicted probability of winning as covariates, predicted probability of winning significantly predicted the value assigned to the poem, $F(1, 47) = 6.93, p < .05$.

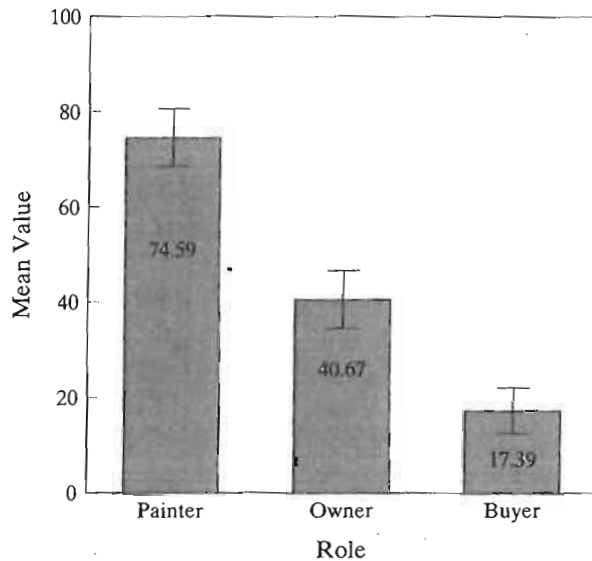
³² We note here that there might be a valid distinction to be made between a subject's "valuation" of the chance to win and her "pricing" of that chance. Consider, for example, Ward Farnsworth, *Do Parties to Nuisance Cases Bargain after Judgment? A Glimpse Inside the Cathedral*, 66 U Chi L Rev 373, 399 (1999).

³³ Although subjects might not have perfect knowledge about their weighted chances to win, any errors should be randomly distributed around the mean.

³⁴ As with our previous experiment, Buyers' mean WTP was slightly higher than rational probability theory would predict. See Buccafusco and Sprigman, 96 Cornell L Rev at 26 (cited in note 1). One possible explanation is that the nature of the scale resulted in a few high bids shifting the mean higher than expected. Another possibility is that Buyers may have attached some significance to the fact that they were being asked to bid on only one painting—and this may have raised their estimation of that painting's chance of winning the contest. Finally, having been told that this was the only painting that she could bid on, it is also possible that each Buyer developed a sense of attachment to her painting even though she did not own it.

previous experiment, the Painters' values differed significantly from the Owners'.³⁵ These results are strongly suggestive of the existence of a *creativity effect*. When internally motivated and engaged in considerable creative effort, creators seem to value their works substantially more than do potential buyers or mere owners.

FIGURE 1. MEAN VALUE ASSIGNED TO ART



Note: Error bars: ± 1 SE

TABLE 1. MEANS (STANDARD DEVIATION)

Role	Value	Probability of Winning	Quality	Regret
Painter	74.59 (24.05)	52.76 (29.46)	8.35 (1.38)	5.07 (3.24)
Owner	40.67 (24.65)	41.89 (32.62)	5.56 (2.13)	3.69 (2.41)
Buyer	17.39 (22.75)	31.77 (29.41)	5.18 (2.36)	3.90 (2.53)

The follow-up questions that we asked the participants can help explain some of the psychological mechanisms responsible for these valuation asymmetries. We focused on three possible explanations: emotional attachment to the work, biased estimates of the likelihood

³⁵ All of these differences are statistically significant at $p < .01$. Similarly, in ANCOVA analysis with role as a fixed factor and quality, regret, and predicted probability of winning as covariates, the effect of role was highly significant. $F(2, 47) = 18.13, p < .0005$. All of the groups differ significantly from one another. Painters assign higher values than both Owners ($t(33) = 4.11, p < .0005$) and Buyers ($t(37) = 7.75, p < .0005$), and Owners assign higher values than Buyers ($t(38) = 3.17, p < .005$).

of winning the contest, and anticipated regret at having sold the winning painting.

1. Emotional attachment.

We focused on creators' emotional attachment to their paintings for two reasons. First, some explanations of the endowment effect posit that it results from owners' feelings of attachment to the owned object leading to greater unwillingness to give it up.³⁶ Second, the creator's sense of attachment to her work is central to most theories of IP based on so-called moral rights, and we wanted to examine whether attachment seemed to be contributing to the value that creators assigned to their works.³⁷ A moral rights theorist might interpret the valuation asymmetries in our experiment as evidence of the creator's enhanced connection to the work. If so, the moral rights theorist may further assert that even though the WTA/WTP gap may result in what, from a purely economic point of view, would be a suboptimal level of transacting, the law should nonetheless recognize and give effect to authors' special attachment to their work and should make no attempt at "debiasing" authors.

Somewhat surprisingly, however, creators' ratings of emotional attachment to their paintings did not predict their valuations. Painters who felt strongly attached to their works were no more likely to assign high values to them than were those who felt less attached to their works. Relatedly, the number of hours that the Painter spent on the painting was also uncorrelated with the Painter's valuation. These results suggest that emotional attachment or labor may not be playing a particularly strong role in creators' valuations of their work; however, forthcoming experimental research suggests that investing certain kinds of labor in objects may make people value them more.³⁸

³⁶ See Korobkin, 97 Nw U L Rev at 1228 (cited in note 9).

³⁷ See, for example, Roberta Rosenthal Kwall, *Copyright and the Moral Right: Is an American Marriage Possible?*, 38 Vand L Rev 1, 2 (1985); Susan P. Liemer, *Understanding Artists' Moral Rights: A Primer*, 7 BU Pub Intl LJ 41, 43 (1998).

³⁸ See Michael I. Norton, Daniel Mochon, and Dan Ariely, *The "IKEA Effect": When Labor Leads to Love* (unpublished manuscript, 2010) (on file with authors). We did not collect data on the emotional attachment of Owners or Buyers on the assumption that they would feel little of it. Accordingly, this leaves open that possibility that even though relatively more attachment did not result in higher values within the class of Painters, overall differences in emotional attachment between Painters and Owners or Buyers may be related to valuation. Of course, even if we did know that Painters claimed higher levels of attachment and higher values, we could not declare that the former was causing the latter. It may simply be the case that creators have stronger attachments to their work but that these attachments do not affect valuation.

2. Optimism.

As noted above, because of the zero-sum nature of the contest, the mean response to the question about the painting's probability of winning the contest should have been 10 percent. A considerable body of research, however, has shown that people have a strong tendency to overestimate their chances of success, especially when asked questions related to personal qualities.³⁹ For example, most students predict that they will finish in the top half of a curved class.⁴⁰ Similarly, the subjects in our study significantly overestimated their chances of winning the prize, with Painters' estimates higher than Owners' and both higher than Buyers' (52.8, 41.9, and 31.8 percent, respectively).⁴¹ Accordingly, it appears that creators' overvaluations are in part logically derived from their assessments of how likely their works are to win the prize. The assessments themselves, however, appear to be considerably irrational. Creators are overly optimistic about their chances of winning and thus each is unwilling to sell her chance for anything close to its objective probabilistic value. This is consistent with our findings from earlier research.⁴²

3. Regret.

A final possible explanation of the higher WTA amounts of Painters and Owners is that these subjects anticipated feeling regret if they sold what turned out to be the winning painting.⁴³ If so, they might rationally conclude that receiving the probabilistic value of the painting would be insufficient to compensate them for the negative

³⁹ See David A. Armor and Shelley E. Taylor, *When Predictions Fail: The Dilemma of Unrealistic Optimism*, in Thomas Gilovich, Dale Griffin, and Daniel Kahneman, eds, *Heuristics and Biases: The Psychology of Intuitive Judgment*, 334, 334 (Cambridge 2002) ("By a number of metrics and across a variety of domains, people have been found to assign higher probabilities to their attainment of desirable outcomes than either objective criteria or logical analysis warrants."); Zlatan Krizan and Paul D. Windschitl, *The Influence of Outcome Desirability on Optimism*, 133 *Psych Bull* 95, 95 (2007) (noting research finding that an individual's accuracy in predicting future events is heavily influenced by the individual's desires regarding those events).

⁴⁰ See Armor and Taylor, *When Predictions Fail* at 334-35 (cited in note 39).

⁴¹ We are uncertain why Buyers exhibited substantially higher probability estimates than would be predicted by classical economics. One possibility is that because they were assigned to an individual painting, they immediately felt a sense of attachment to it even though they did not "own" it. See note 34. It is also possible that the subjects did not understand probability estimates perfectly. Even if this is true, the relative differences between the groups still support our results.

⁴² See Buccafusco and Sprigman, 96 *Cornell L Rev* at 26 (cited in note 1).

⁴³ Several commenters suggested to us that the Painters' regret aversion could also be characterized as a propensity to seek risk. Whether the trait is labeled as an aversion to anticipated regret or an attraction to risk, the result is to drive Painter valuations higher than either Owners' or Buyers'. Our questions about regret aversion did not focus on attraction to risk unlinked to anticipated regret following potential loss. We may consider broadening our questions in future studies to capture all facets of regret aversion and risk attraction.

feelings associated with regret. Our previous research suggested, but did not directly test, the possibility that such regret aversion was driving our results.

Our results in this study are somewhat mixed. On the one hand, across all roles, subjects' regret was very close to being a significant predictor of valuation when controlling for variance in role.⁴⁴ This suggests that subjects' valuation decisions might have been informed by their predictions of how much regret they would feel at giving up the winning painting. On the other hand we detected no difference in predicted regret based on subjects' roles. Thus, Painters did not anticipate feeling more regret than did Owners or Buyers. Accordingly, we are hesitant to ascribe too much weight to the effect of regret on the creativity effect.

Although fear of regret may be playing some role in the heightened valuations of creators, the largest effect appears to come from their markedly over-optimistic assessments of their chances to win. Accordingly, we believe that IP law may have a considerable role to play in mitigating creativity effects. While there might be good reasons to credit creators' valuations if they are the result of regret aversion or enhanced feelings of emotional attachment, we can see no valid reason for respecting pricing decisions that are driven almost exclusively by irrational biases. For these reasons, our results suggest that debiasing, if it is possible at a reasonably low cost, is an appropriate task for IP law.⁴⁵ Accordingly, the next Part turns to legal solutions for diminishing the creativity effect.

⁴⁴ In ANCOVA analysis of value, with role as a fixed factor and quality, regret, and predicted probability of winning as covariates, regret is very close to being significant ($p = .057$).

⁴⁵ Relatedly, we should note one potential confounding variable in our study. Prior research has shown that the strength of the endowment effect is positively correlated with length of ownership. Michal A. Strahilevitz and George Loewenstein, *The Effect of Ownership History on the Valuation of Objects*, 25 J Consumer Rsrch 276, 285 (1998). In our study, the Painters obviously had spent much more time with their works than had the Owners. Thus, it is impossible for us to isolate the amount of the valuation difference attributable to creativity from that attributable to length of ownership. (We are indebted to Orly Lobel for this observation.) Although identification of the precise source of the creativity effect awaits further elucidation, we have two observations that suggest that our results from this experiment are nonetheless valuable. First, length of ownership will tend to differ in the real world; in the usual course, creators will possess their works for some time before licensing or transferring them to intermediaries, and even after license or transfer, creators are often likely to continue to think of their work as "theirs." For this reason, it seems to us that differing length of ownership is an ecologically valid feature of our experiment—that is, it likely reflects real-world conditions. Second, and importantly, we believe that the effect, if any, of differing length of ownership is testable empirically. And even if length of tenure accounts for a substantial portion of the creativity effect (which we doubt, at least as an initial hypothesis) we are still faced with creators' tendency to manifest higher WTA, which results in a suboptimal level of contracting compared with deals involving mere owners.

III. LEGAL IMPLICATIONS OF THE CREATIVITY EFFECT

Our study revealed significant valuation asymmetries that created large gaps between (1) Buyers' WTP and the WTA of both Painters and Owners, and, importantly, (2) the WTA of Painters compared to Owners. The first asymmetry—that is, the one between the Buyers and the two types of subjects on the sell-side of the market (Painters and Owners)—is a replication of the results of our first study, and it represents an extension into the domain of IP of the standard endowment effect literature. The new finding in this study is *the gap in the WTA amounts of Painters versus Owners*. This “creativity effect” is distinctive to creative authorship and inventorship, suggesting that valuation anomalies affecting transactions in creative goods are likely to be especially severe when the seller or licensor in an IP transaction is the creator.

The valuation anomalies that we find have significant implications for IP law and policy. The gap between the amount that creators are willing to accept to sell their rights and the amount that buyers are willing to pay to obtain them could pose substantial difficulties for the efficient allocation of resources. Accordingly, we discuss a variety of potential tools for mitigating the creativity effect, some of which merely require different mechanisms for structuring IP transactions between private parties and others that require substantial government intervention. What we do not know about IP markets is at least as great as what we do know.⁴⁶ At this point, we cannot determine whether the benefits of these solutions will be outweighed by their costs. Nonetheless, we suggest that a variety of solutions may be available and that decisions about their desirability should be based on empirical assessments of their respective costs and benefits.

The results that we present here expand considerably on our findings in *Valuing Intellectual Property*. Our new data demonstrate a gap not just between creators' and buyers' valuations but also between creators' and mere owners' valuations. We discussed the legal implications of the standard endowment effect valuation gap in our earlier paper.⁴⁷ Those implications have become more significant in light of our new findings. Space limitations prevent us from reexamining those issues in great depth here. Instead, we briefly discuss them in the context of the creativity effect and encourage readers to consult the earlier paper for more detailed analysis. We also explore a series of newly raised implications.

⁴⁶ For example, very little is known about the effects of group decisionmaking on valuing goods.

⁴⁷ See Buccafusco and Sprigman, 96 Cornell L Rev at 31–44 (cited in note 1).

A. Incentives and the Creativity Effect

Before we discuss methods for mitigating the creativity effect, it is worth exploring the effect's implications for incentivizing creative effort. The chief goal of IP law is to establish appropriate incentives for authors and inventors,⁴⁸ and it is important to understand how successful the law is at achieving this goal. Recent research has begun to explore these issues,⁴⁹ and our experiment offers additional insights.

Our data suggest that creators overvalue their work in large part because they are over-optimistic about its chances of success. If the creativity effect arises early enough in the creative process, then it may affect incentives to create. That is, if the effect arises as early as the creator's *contemplation of creation*, or even, when the creative project requires sustained effort, at some early stage of the work, then the creator's tendency to overvalue the contemplated creative good is a factor in the calculation of optimal scope and duration of IP. Because creators subject to the creativity effect will—if the effect arises early enough—tend to overestimate the expected return from their creative efforts, the duration or scope of IP rights can be reduced relative to the optimal duration and scope if creators were rational evaluators of the expected value of their work.

Although our experiment does not reveal the point in the creative process at which the creativity effect arises, we can imagine experiments structured to illuminate that question. To date, discussion of IP scope and duration has proceeded—to the extent that it relies on any rational basis at all other than industry rent-seeking—upon the (largely implicit) assumption that creators reckon up the costs and likely returns of their creative efforts according to what the rational choice model would predict.⁵⁰ Our study suggests that more work is needed to better understand whether this is in fact true.

Just as the creativity effect may have an unforeseen impact on incentives, removing the effect entirely might produce incentive and motivation issues of its own. In many cases, the willingness to engage

⁴⁸ The US Constitution empowers Congress “[t]o promote the Progress of Science and the useful Arts, by securing for limited Times to Authors and inventors the exclusive Right to their respective Writings and Discoveries.” US Const Art I, § 8, cl 8.

⁴⁹ See generally, for example, Jeanne C. Fromer, *A Psychology of Intellectual Property*, 104 Nw U L Rev 1441 (2010); Gregory N. Mandel, *Left-Brain versus Right-Brain: Competing Conceptions of Creativity in Intellectual Property Law*, 44 UC Davis L Rev 283 (2010).

⁵⁰ See Thomas H. Davenport and Jeanne G. Harris, *What People Want (and How to Predict It)*, 50 MIT Sloan Mgmt Rev 23, 29 (Winter 2009) (describing movie studios' use of neural network analysis to make predictions about a film's likelihood of market success). Consider also Posner, 19 J Econ Persp at 58–62 (cited in note 25) (proposing a modified IP regime combining public subsidies with limited property rights to ensure that “the creator of intellectual property is compensated for the cost of creation” while also ensuring public access to those creations).

in creative tasks may itself be a function of individuals' excessive optimism about their likelihoods of success.⁵¹ After all, what rational person would leave a stable, well-paying job to attempt to write the Great American Novel or develop a car powered solely by trash? Given the incredibly long odds of success in these enterprises, people might need to be a little irrational to be willing to attempt them. Yet society needs some people occasionally to take those odds. Thus, we need to be careful when contemplating debiasing creators by making them more rational calculators of probabilities. Although the world might be better off with fewer coffeehouse poets and crackpot inventors, it would be a shame to discourage the future Joyces and Edisons.

B. The Costs of IP Bargaining and Some Possible Solutions

The creativity effect reported in this Article represents a substantial and previously unrecognized hurdle to efficient allocation of IP rights. Our previous research suggests that significant bargaining gaps are likely to appear between the creators of works and potential buyers. The data we present in this Article suggest that when creators are engaged in more substantial and intrinsically motivated creative effort those gaps expand greatly. Whereas our earlier work indicated a 2-to-1 ratio between creators' and buyers' valuations, this experiment suggests a ratio on the order of 4-to-1. Moreover, and importantly, the additional creative effort associated with the paintings in this study compared to the haikus of the previous study opened up a gap between creators' valuations and those of mere owners. These diverging assessments of value increase the transaction costs associated with IP bargaining over those associated with bargaining over ordinary property.

The discovery of new and more significant transaction costs associated with bargaining over IP is especially troubling because, unlike rights in real or personal property, IP rights are rarely given initially to the party best able to exploit them.⁵² Under these circumstances, the overall social utility of IP law depends on a reasonably efficient mechanism for transferring rights from initial rightsholders to ultimate exploiters. If the creativity effect adds to the costs of contracting, then a number of otherwise valuable transactions will not occur, and the social utility of an IP law structured around strong property rules (that is, rights to exclude) will be lower than we might expect.

⁵¹ We thank Oskar Liivak, John Duffy, and Ed Kitch for encouraging us to think more about this point.

⁵² See Buccafusco and Sprigman, 96 *Cornell L. Rev.* at 34 (cited in note 1).

It is important to emphasize that the questions that our research presents about the efficiency of IP law are matters of degree. The valuation gaps that we demonstrate do not mean that IP transactions will not take place; obviously, they do every day. Our results suggest, however, that valuation gaps may create substantial inefficiencies in IP markets that lead these markets to produce a suboptimal level of transactions. Recent empirical research has shown that wider bargaining zones result in substantially fewer agreements being reached.⁵³ Given the 4-to-1 ratio that we show between creators' and buyers' valuations, there is good reason to fear that parties to at least some IP transactions—most likely those involving highly differentiated creative goods and not involving a transaction intermediary such as an agent or publisher—will manifest particularly wide gaps and, therefore, that a number of welfare-enhancing IP transactions may not occur.

Importantly, the results of this study also present the disturbing possibility that overvaluation might grow, and a greater number of IP transactions fail, as the quantum of creativity involved in the production of a particular work increases. The data reported in this Article suggest, when assessed in light of the data from our prior experiments, that works embodying more creativity are likely to be particularly overvalued by their creators. Our first study demonstrated a 2-to-1 valuation gap when the creators were externally motivated and produced only a three-line poem. Here, the creators produced a substantial creative work and were, like real-world creators, in part internally motivated, and we observed a 4-to-1 valuation gap. Further research is needed to parse these results, but our data have introduced the possibility of a “dose–response curve” associated with creativity and value such that the more creativity that authors and inventors invest in their works, the greater the valuation anomaly. This possibility awaits further testing, but even the prospect of a dose–response relationship between creativity and overvaluation is especially troubling for IP law. The most creative works are likely to be the ones with the highest social value. They are also, in general, the works most likely to be created by individual authors (motion pictures are, of course, an exception) and thus subject to the fullest extent to the creativity effect. The data we report in this Article show that it is creator valuations, and not the valuations given by mere owners, that increase markedly when the traded good embodies substantial creativity.

⁵³ See Russell B. Korobkin and Joseph Doherty, *Who Wins in Settlement Negotiations?*, 11 *Am L & Econ Rev* 162, 196 (2009).

1. Royalty bargaining.

The potential inefficiencies generated by the creativity effect result from drastically different assessments of a work's likelihood of success and, thus, its value. The contracting parties in IP transactions may be able to minimize the effects of this valuation gap by structuring deals in terms of running royalties that may include a lump sum payment to the author followed by subsequent payments determined by market success. Such contracts theoretically enable the parties to agree to disagree about the value of the underlying work. As yet, little empirical or theoretical work has been conducted on the economics of royalty contracts, but we are skeptical of their ability to bridge bargaining gaps of the magnitude exhibited by the subjects in this study. First, royalty contracts require continuing accounting and monitoring, are therefore relatively expensive to implement, and as a result are unsuited for a large number of smaller IP transactions. Second, and more seriously, royalty contracts still require bargaining about the terms of the payments and the size of the lump sum. If creators are over-optimistic about the chances of their works' success, they may insist on a disproportionate share of the total profit. The creators in this study were supremely confident in their chances of winning the prize, and it is difficult to imagine them settling for a small share of the prize if they feel optimistic about winning the entire thing.⁵⁴

2. Intermediaries and works made for hire.

Our new data suggest that, as the amount of creativity incorporated into a work increases, creators' valuations will begin to diverge from owners'. Accordingly, it seems likely that the use of transaction intermediaries may mitigate some (but not all) of the creativity effect.

The valuation gap in our study between Painters and Buyers is substantially larger than that between Owners and Buyers. This is not to say that Owner–Buyer transactions are proceeding according to the rational actor model—these transactions are subject to a substantial pricing anomaly, but they are closer than Painter–Buyer transactions to efficient outcomes.⁵⁵ Our data suggest that, on average, we can expect that transacting will be more efficient when rights to creative goods are

⁵⁴ For a fuller discussion, see Buccafusco and Sprigman, 96 Cornell L Rev at 36–38 (cited in note 1). In addition, the effectiveness and availability of royalty contracts is limited by both industry norms and costs. See *Lucent Technologies, Inc v Gateway, Inc*, 580 F3d 1301, 1326 (Fed Cir 2009) (discussing the “[s]ignificant differences” between running royalty and lump sum licenses, including the ongoing “administrative burdens of monitoring usage of the invention” and risk of renegotiation due to “a subsequent decision not to use the patented technology”).

⁵⁵ See notes 34–35 and accompanying text.

in the hands of intermediaries rather than authors (in the case of copyrighted works) or inventors (in the case of patented inventions).

Our data are only a first cut, but they suggest that we should think further about the value, in both the copyright and patent contexts, of encouraging initial ownership of IP rights in some person or firm other than the creator. In the copyright context, this means revisiting the scope of the rules governing whether a particular work is treated as a “work made for hire” (WMFH). In the patent context, we may wish similarly to reconsider the current law’s very strict “inventorship” requirement. And with respect to both patent and copyright, we might also restructure the current rules requiring that assignments and exclusive licenses be in writing. We should make clear that we cannot, based on the experiments that we have completed and in the space allotted us here, give full consideration to whether any of these doctrines should be modified to account for the creativity effect and the special pricing anomalies that may follow from creative authorship and inventorship. We can, however, briefly describe the elements of copyright and patent law that we should consider changing if future work makes clear that we should be deeply concerned about the efficiency of IP transactions.

Under current law, initial ownership of a copyrighted work vests in the work’s actual author, unless that work is denominated a WMFH.⁵⁶ The WMFH doctrine has two prongs. A work is a WMFH if either (a) it is created by an employee within the scope of his or her employment, or (b) it falls within a narrow list of enumerated types of work that may be treated as works made for hire even in the absence of an employment relationship if the author and the sponsor agree in a written instrument that the work will be so treated.⁵⁷ If, as our results suggest, copyright transactions are less inefficient when the seller is a mere owner rather than an author, then there are several ways in which we might expand the current WMFH doctrine. Most dramatically, where an act of authorship involves some non-de minimis element of sponsorship, we might restructure the doctrine as a default rule favoring initial ownership by the sponsor in the absence of a written agreement providing otherwise. Alternatively, we might achieve a less sweeping but nonetheless significant expansion of WMFH by adding additional categories of work to the current law’s second prong or by allowing WMFH by written agreement for all works.

⁵⁶ See 17 USC § 201(a).

⁵⁷ See 17 USC § 201(b) (defining “works made for hire”); *Community for Creative Non-Violence v Reid*, 490 US 730, 738, 750–51 (1989).

The case with patent law's inventorship requirement is starker. Under current law, a patent application may be filed only in the name of the actual inventor or inventors, in whom initial ownership will vest.⁵⁸ Although inventorship arguably has constitutional implications,⁵⁹ as a policy matter, a strict inventorship requirement is nowhere entailed in the structure of patent law. We may choose to define circumstances in which a sponsoring entity gains initial ownership—for example, where the parties agree beforehand in a written instrument or, even, were we to favor a more aggressive expansion of sponsor ownership of patented inventions, wherever there is sponsorship and the parties *fail to agree* beforehand that ownership will *not* vest in the sponsor.

3. Formalities.

Our data on the creativity effect deepen the concern first noted in our prior article that the tendency of creators and owners to overvalue their work will impose previously unanticipated inefficiencies on markets in IP structured according to the current law's strong property rules. IP law could employ an expanded system of IP formalities to diminish the impact of creativity and endowment effects by restricting property-rule remedies to works that meet some substantial valuation threshold.⁶⁰ Because negotiations involving works with substantial commercial value offer the promise of significant private gains, these negotiations will be, on average, better able to withstand the costs of negotiation arising from endowment and creativity effects. These observations suggest that it may make sense to employ IP law's property rules only in cases where owners send some signal that a work is likely to trade above a certain minimum value.

As we described in our previous article, patent law already does this through its examination procedure and maintenance fees.⁶¹ In contrast to patent law, copyright law has largely discarded the formalities that formerly worked to focus the copyright system on works of significant commercial value.⁶² The Copyright Act of 1976 created a modern regime that lacks any internal defense against endowment and creativity effects. While the United States cannot reimplement formalities due to its obligations under the Berne Convention,⁶³ we

⁵⁸ See 35 USC § 102(f).

⁵⁹ See US Const Art I, § 8, cl 8. See also, for example, Peter K. Yu, *Cultural Relics, Intellectual Property, and Intangible Heritage*, 81 *Temple L Rev* 433, 450 (2008).

⁶⁰ For a fuller discussion, see Buccafusco and Sprigman, 96 *Cornell L Rev* at 38–42 (cited in note 1).

⁶¹ See *id.* at 38–39.

⁶² See *id.* at 39–40.

⁶³ See Christopher Sprigman, *Reform(aliz)ing Copyright*, 57 *Stan L Rev* 485, 547 (2004).

can obtain many of the benefits of the traditional formalities without offending Berne. As we described in our previous work, copyright's remedies regime could move closer to a liability rule, conditioning the availability of injunctive relief and disgorgement of profits on prior registration of a work in the same way that registration is currently used as a condition for statutory damages and attorneys' fees.⁶⁴ Such a rule would be particularly beneficial in light of the creativity effect that we demonstrate here, because low-value works will less often be worth the added costs associated with other creativity effect mitigators such as intermediaries or royalty contracts.

4. Property rules versus liability rules.

The broadest and ultimately most important implications of our study relate to issues about the fundamental structure of IP rights and remedies. IP law is presently structured around property rules. But if the wide disparities between Buyers' WTP and Painters' WTA that we found in our study characterize a range of IP transactions, then parties seeking to license or otherwise transfer ownership of creative works will face substantial negotiation costs arising from the need to bridge wide differences in valuation.⁶⁵

The data we report in this Article sharpen this concern relative to the findings reported from our previous experiments. The costs and benefits of liability rules and property rules, which we outlined in our *Cornell Law Review* article, require careful comparison when selecting the appropriate standard for IP law.⁶⁶ Importantly, however, in the IP context, property rules and liability rules may create different inefficiencies: those created by property rules may tend toward overvaluation and failed bargains, while the valuation errors created by liability rules will tend to be distributed symmetrically on both sides of the optimal price. Moreover, our latest data show that transactions in creative work are subject not simply to endowment effects but also to special pricing anomalies that appear to be related to creators' engagement in creative work. These findings are particularly significant in the IP context not only because they suggest that markets in IP may be less efficient than heretofore presumed. They also undermine the normative justification for an IP law structured around strong property rules.

The pricing anomalies we see in this experiment will not necessarily suppress creators' ex ante incentives more than they would under

⁶⁴ See Buccafusco and Sprigman, 96 *Cornell L Rev* at 41 (cited in note 1). See also 17 USC § 504(c) (providing for statutory damages); 17 USC § 505 (providing for costs and attorneys' fees).

⁶⁵ Buccafusco and Sprigman, 96 *Cornell L Rev* at 34 (cited in note 1).

⁶⁶ *Id.* at 33–35.

rational choice assumptions. If creativity effects arise early enough in the creative process, then it may be that they act as enough of a spur to creative effort (by virtue of the creator's early over-estimation of the ultimate return that the work will bring) such that creator incentives will strengthen overall. We cannot yet say whether this is true, but we can imagine ways to test it. Additionally, if creativity effects arise early enough in the creative process to meaningfully affect creator incentives, then it is not clear whether these effects would vary based on the type of legal rule that governs transactions in the particular form of IP at issue. That is, we know that liability rules shrink the role of endowment effects *in transacting*, but we do not know whether, in a regime where markets in a particular type of IP are governed by a liability rule, early-arising creativity effects still drive up creator incentives. This is an important question that needs to be answered if we are to undertake a careful reassessment of the relative values of property and liability rules in IP law, and again, we can imagine experiments designed to illuminate this issue.

CONCLUSION

This Article has presented evidence that is suggestive of the existence of a creativity effect that distorts the valuations that creators attach to their work. Creators are likely to overvalue works that they were internally motivated to create and that required substantial creative effort compared with both potential purchasers and mere owners of the works. Our data suggest that this valuation anomaly is driven primarily by creators' irrational optimism about their works' likelihoods of success. Accordingly, we have suggested possible legal solutions that might diminish the inefficiencies associated with the creativity effect either by debiasing creators or by altering the legal mechanisms for owning, transferring, and using IP rights. In order to know which solutions are likely to be most successful, future research is needed to understand more fully the nature of the creativity effect.