

Copyright Infringement in the Market for Digital Images

By HONG LUO AND JULIE HOLLAND MORTIMER*

The role that copyright protection plays in supporting creative industries, including film, music, videos, art, books, and photography is often debated among policy makers. Furthermore, new technologies for sharing creative goods create the potential for new forms of infringement, and challenge established methods of copyright enforcement. Drawing upon a new, extensive dataset on infringement and settlement efforts in the market for digital images, we establish several important facts about (i) the nature of copyright infringement, and (ii) efforts to settle instances of past infringement.

The nature of copyright infringement in digital images differs in important ways from infringement in the markets for music and movies, which have been more extensively studied in the literature. First, opportunities for infringement are ubiquitous. An infringer need not actively log into a peer-to-peer file-sharing network to infringe; one need only right-click an image found via an online search. Relatedly, infringement of digital images is often unintentional. Unintentional infringement may arise either through misinformation about licensing obligations, or because third parties infringe on behalf of a user (e.g., a web designer includes an image on a firm's website). Indeed, infringing users may be unsure of how to legitimately license an image found via online search. Finally, another important distinction is that businesses are typically the target customers

for digital images, whereas individuals purchasing through retail outlets constitute an important share of copyright holders' revenue for music and movies. As a result, enforcement efforts in digital images are typically aimed at firms rather than individuals.

The nature of infringement in this market has important implications for both prevention and settlement efforts. Prevention efforts may take three basic forms: running information campaigns to educate users about the potential for unintentional infringement, simplifying and expanding ways to acquire legitimate licenses, and working with intermediate platforms, such as online search and social media sites, to reduce opportunities for infringing use. Alternatively, new monetization methods may be pursued. For example, in 2014, Getty Images made 35 million photos from their catalog available for non-commercial use for free under the condition that users embed the image using Getty Images' embed tool. Embedding provides credit to the photographer and agency, and in principle, would allow Getty Images to gather data on users and run ads similar to those on YouTube. By providing a link to the licensing site, embedding may also make the legal obligations of using copyrighted works more transparent and provide access to licensing options.

When enforcement methods fail to prevent infringement by commercial users, the focus of a copyright holder turns to settlement efforts, which provide a form of 'ex-post' licensing. Settlement efforts are important for two reasons: first, settlement provides a means of recovering payments owed for past use, and second, settlement efforts may discourage future infringement. Conversely, failing to pursue settlements for past use may be expected to encourage more infringing behavior in the future.

The nature of infringement – especially the pervasiveness of unintentional infringe-

* Luo: Harvard Business School, Morgan Hall 241, Harvard Business School, Boston, MA 02163. (email: hluo@hbs.edu); Mortimer: Boston College, Department of Economics, 140 Commonwealth Ave, Chestnut Hill, MA 02467 and NBER (email: julie.mortimer.2@bc.edu). We thank the Agency, and especially the compliance team, for providing the proprietary data and for their collaboration on two field experiments. We also thank Danielle Wedde and Esther Yan for excellent research assistance. All errors and omissions are ours.

ment – corresponds to two important facts about settlement efforts in the market for digital images. First, price may not be the primary factor that influences an infringer’s willingness to settle. Second, the typical pricing strategies that are considered in bargaining models may not apply in the usual way.

Copyright infringement in recorded music

The music industry provided early insights into how copyright holders might respond to new sharing technologies among users, and the effectiveness of these responses. Much of the debate about the impact of infringement in that setting focused on the potential for displacement of legitimate sales.¹ Many argued that illegitimate downloads of copyrighted music files did not necessarily fully displace legitimate purchases, as some downloads simply reflected extra listening that would not have occurred at a positive price. Indeed, some argued that free downloads may have led to additional legitimate purchases of an artist’s other works (e.g., other recorded songs, or ticket purchases for live performances).² While unintentional infringement in this setting was possible, most users, copyright-holders, and researchers understood that the bulk of infringing behavior on peer-to-peer networks was, to some degree, intentional.

In response to illegitimate music downloads, copyright holders pursued litigation efforts against Napster and individual downloaders.³ While legal efforts against Napster succeeded in shutting down that particular file-sharing service, new file-sharing networks arose, and many sources identify infringement as a continuing challenge for copyright holders in the music industry. According to executives in the market for digital images, the lesson learned

from the music industry was that a purely litigation-based approach was unlikely to be an effective option for either preventing infringement or settling past infringing use.

I. The Stock Photography Industry

The market for stock photos clears through agencies, which serve as platforms between photographers and customers. Customers are typically businesses; advertising agencies, newspapers, and publishers are frequent users of digital images, but firms in virtually all industries use images in their marketing efforts. An agency collects licensing fees from customers and pays royalties to photographers, who may choose to allow licensing exclusively with one agency, or through multiple agencies.

Many stock images may be licensed for unlimited use after a one-time payment under a model that the industry calls “Royalty Free” (RF). Payment plans for RF images vary across agencies, and may include both a la carte options, as well as subscription plans. Subscription plans typically allow for a fixed number of downloads per month for a monthly fee. Moving beyond RF images, there are premium, or ‘high concept’ images, which incur licensing fees based on the duration, size, and use of an image. The industry refers to these images as ‘Rights Managed’ (RM) photos. An example of pricing for an RM image might be a three-month license to use a low-resolution version of an image on a secondary website page for \$400, or a one-year license to use a high-resolution version on a social media platform for \$800. In addition to recording licenses for each image in its portfolio, an agency may use software to detect infringing use. Detection technology typically monitors a comprehensive set of websites and identifies the use of photos from an agency’s portfolio. Detected photos are checked against an agency’s licensing database in order to determine the legitimacy of use.⁴

In related work, (Luo and Mortimer

¹For discussions of digital piracy more generally, see Belleflamme and Peitz (2012) on the theoretical literature, and Waldfogel (2012) for empirical evidence.

²See Oberholzer-Gee and Strumpf (2007) and Mortimer, Nosko and Sorensen (2012), among others.

³For statistics on litigation activity in this market, see <http://www.wired.com/2010/05/riaa-bump/>.

⁴It is not possible to clearly determine the legitimacy of use for all photos. For example, some photos are not licensed exclusively through a single agency.

2015), we use detailed data on detected infringement from one large agency (hereafter, Agency). On a yearly basis, the Agency detects tens of thousands of infringement cases. The Agency pursues settlement for selected cases that involve exclusively-distributed RM images for which the infringing use is commercial. Until September 2013, the Agency sends settlement-request letters to infringers, in which infringers are asked to pay the appropriate size and usage-based licensing fee (ranging from \$380 to \$825 per image) plus \$400 to cover the average per-image cost of pursuing settlement. The additional \$400 ‘cost to pursue’ is not broken out separately from the base licensing fee.⁵

From October through December of 2013, the Agency ran a *pricing experiment*, in which it eliminated the \$400 ‘cost to pursue’ for a group of randomly-selected infringers. Following that experiment, from January through March of 2014, the Agency eliminated additional the \$400 cost for all infringers and ran a *message experiment*, in which they added text to the settlement request letter explaining the price reduction and acknowledging the possibility of unintentional use.⁶ Cases were allocated into a control group, which received no additional message, and four treatment groups, which received different variations of the additional message.

II. The Nature of Infringement

Infringement in digital images is characterized by two key facts. The first is that many infringers are not aware that they have infringed at all, or that they have any legal obligation to pay for the use of an image. The second fact is that infringers are typically unaware of an image’s price at the time of infringement.

The first fact, that much of the infringement in this market is unintentional, is nicely illustrated by correspondence be-

tween the Agency and infringers. During the period of January through March of 2014, when the Agency ran the message experiment, we obtained detailed correspondence data on 909 firms that responded to a settlement-request letter. Among these respondents, 85 percent claim that they are either unaware of the infringement, or that the infringement is the result of hiring a third-party to design the website on which infringement occurred. Unawareness can occur because an infringer is not aware that the image is displayed on their website (perhaps because an intern placed it there), or because the infringer obtained the image through an online search, without realizing that its use required authorization. This latter reason is largely how infringement occurs, and applies to both the end-user directly (i.e., the owners or employees of a firm), and to third-party infringers (e.g., web-designers).⁷ Among the respondents that we observe, the smallest firms are the most likely to be unaware or exposed through a third party (at 88 percent), while the largest firms are slightly more likely to infringe through the improper use of an existing license (although even for the largest quintile of firms, improper use of an existing license constitutes only nine percent of all responses).

The prevalence of unintentional infringement contrasts to previously-studied markets for creative goods such as music. In that industry, infringers needed to actively log into peer-to-peer sharing networks in order to download a file. Furthermore, active ‘anti-piracy’ campaigns made users more aware of licensing obligations. The phenomenon of unintentional infringement has begun to emerge in other contexts as well. A recent study of the 3D printing market illustrates a similar challenge when people download copyrighted designs without being aware of their licensing obligations (Depoorter 2014); other (older) examples include sewing patterns, sheet music, and educational materials.

⁵Thus, infringers receive a single settlement request ranging from \$780 to \$1225 per image.

⁶Beginning in January 2014, the Agency also ceased to pursue settlement with the smallest infringing businesses.

⁷Note that the prevalence of third-party infringement also potentially separates the decision to infringe from the legal liabilities associated with infringement.

The second important fact about infringement in this market is that pricing and other licensing information is often difficult to obtain. Online search engines retrieve images based on key words contained in an image’s metadata. This means that search engines typically link to legitimate copies of an image (i.e., other customers’ licensed copies), rather than an agency’s link with licensing and pricing information. This limits an agency’s ability to promote legitimate licensing via search engines.

Using a separate data file from the Agency on legitimate and illegitimate use for a set of 2,475 top-selling images in 2012, we examine the correlation between legitimate use, average price, and illegitimate use. While price is presumably determined endogenously, the existence of a downward-sloping demand curve in the licensed market seems plausible. We find that illegitimate use is positively correlated with the number of legitimate licenses (and thus, mechanically, is negatively correlated with the average price of a legitimate license). As legitimate licensing expands the use of an image, more opportunities for infringement occur, and infringement becomes more ubiquitous for low-priced, not high-priced images. This contrasts to a typical theoretical expectation about piracy, in which higher prices in the licensed market increase the ‘return to piracy’ and induce more (not fewer) instances of infringement.

Theoretical models of piracy (and crime in general) often model the decision of an agent to undertake an illegal act as trading off the pay-off from taking the action and the expected legal risk, which consists of a probability of detection and a penalty. The prevalence of unintentional infringement and the lack of information about price in the market for digital images suggest that in some contexts, we should consider an alternative modeling framework. For example, one may want to examine infringement through a model in which there are both informed users who follow the usual trade-offs, and uninformed users who infringe ‘probabilistically,’ as a function of the availability of content.

III. Settlement Efforts

The uninformed nature of infringement has two important implications for settlement efforts. First, price may not be the only factor that affects an infringer’s willingness to settle. Indeed, it may not even be the primary factor in an infringer’s response. Second, the non-price methods that a copyright holder uses when approaching an infringer may affect the outcome of settlement efforts.

The notion that price may not be the primary factor in an infringer’s willingness to settle receives validation in the results of the Agency’s pricing experiment. Luo and Mortimer (2015) provide detailed analysis of the two experiments. Recall that the nature of the pricing experiment is to randomly remove \$400 from the requested amount (or not). The \$400 cost was not broken out separately, so the pricing experiment is one in which the overall requested price is exogenously varied by roughly 50-100%.

The result of removing the \$400 cost was a (marginally) significant but small increase in the settlement rate, from 12.5% to 15.6%.⁸ The process of settlement often involves a phone call between the infringer and the Agency, during which the parties may negotiate a lower price. Cases with the additional \$400 cost are more likely to negotiate a discount. Nevertheless, the amount per settled case is higher for these cases, and this more than offsets the lower settlement probability. As a result, the expected revenue per case is higher at the higher requested amount (at \$92 vs. \$82 per case); the difference is not statistically significant. This is consistent with a relatively price inelastic ‘demand for settlement’ by infringers over this range of price variation.

The notion that non-price methods may affect the outcome of settlement efforts receives validation in the results of the Agency’s message experiment. Recall that for the message experiment, the Agency adds text to the settlement request letter

⁸These figures refer to outcomes 30 days after the initial settlement-request letter is sent.

acknowledging the possibility of unintentional use and explaining that a price reduction of \$400 has been applied. In contrast to the pricing experiment, infringers are much more elastic with respect to the additional message. The control group has a settlement rate of 14%, but the settlement rate among firms that receive a message is 26.5%.⁹ The degree to which infringers negotiate lower prices during the settlement process is not statistically significantly different between the control and treatment groups. As a result, the higher settlement rate induces an expected revenue per case that is roughly \$66 higher when a message is added to the settlement request letter, holding price fixed.

There may be multiple explanations for the infringer's responsiveness to the additional message. Luo and Mortimer (2015) argue that one plausible explanation lies in the nature of 'uninformed' infringement. Proactively acknowledging the possibility of unintentionality may move infringers away from calculating legal risks (which are likely to be small), and towards attaining a collaborative outcome. For some firms, this acknowledgement may motivate a desire to correct a mistake.¹⁰ For other firms, the acknowledgement of possible unintentionality may make the settlement request letter conform more closely to other standard invoices, providing a smoother path for processing payment instead of invoking a costly internal legal process.

Two important implications of 'uninformed' infringement for settlement are: (i) infringers may be relatively price-inelastic, and (ii) non-price aspects may play an important role in determining outcomes. Theoretical models of settlement often use games in which agents engage in bilateral bargaining, and pricing is endogenously determined.¹¹ A distinction in our context is that the initial settlement offer is not set

endogenously to maximize settlement revenue; rather it is set according to the list price in the ex-ante licensing market.¹²

Why might an agency set the price of settlement in this way? One reason may be due to the platform nature of an agency. Photographers have signaled a willingness to sell only at the ex-ante licensing price. Lowering price below this point may affect the willingness of a photographer to license through the agency in the future, and also raises the return to infringing. Other reasons may lie in the uninformed nature of infringement. For example, raising price may be unlikely to provide additional deterrence when infringement is uninformed. Finally, if users learn the ex-ante licensing price and consider it to be 'fair compensation' for use, then requesting an amount that is higher than the list price may lead infringers to resist settling.¹³

An outcome from the message experiment addresses the notion that infringers may respond to a reference point when adjudicating the 'fairness' of a request. In two different versions of the message, we explain the price reduction as either 'waiving a surcharge' or 'providing a discount.' The surcharge waiver language establishes the list price as a reference price, whereas the discount language reports only the total amount, essentially establishing a reference price which is \$400 higher than the list price. After 120 days, a typical small infringer is more likely to settle when the price reduction is explained as a discount, than when it is presented as waiving a surcharge.¹⁴ This is consistent with infringers regarding the list price as a fair price for compensation, particularly among infringers that take longer (and may be more reluctant) to settle.¹⁵

¹²The licensing fee for infringing use is a weighted average of all the list prices that fall into a broader use category. Initial settlement offers in infringement cases also do not vary the requested amount across different types of infringers, despite having information about their observable characteristics.

¹³This is consistent with the notion of a reference point (Kahneman and Tversky 1979).

¹⁴The effect is also higher at 30 days, but the difference at that point is not statistically significant.

¹⁵Relatedly, the Agency has found that explaining

⁹These figures again refer to outcomes 30 days after the initial settlement-request letter is sent.

¹⁰In the tax compliance literature, Feld and Frey (2002) show that courteous treatment by the tax authorities (e.g., a presumption of innocence) dampens tax evasion.

¹¹See for example Bebchuk (1984).

IV. Concluding Thoughts

Many models of copyright enforcement are motivated by markets in which willful (or at least, informed) violations are the dominant form of infringement. For these markets, efforts at preventing infringement typically focus on deterrence factors, such as the probability of detection, the size of penalties paid upon detection, and the return to infringement.¹⁶ In contrast, the increasing use of digital distribution for some creative goods has led to a high degree of inadvertent infringement in many markets. In these markets, an increase in the size of expected penalties provides a much less effective form of deterrence. Furthermore, versioning, or other forms of price discrimination, may be ineffective when consumers are unaware of pricing at the time of infringement.¹⁷

Evidence on infringement of digital images suggests that uninformed infringement is an important feature of this and similar markets. This shapes the strategies adopted by copyright holders. For example, it motivates a focus on educating users (including third-party service providers) about licensing options and legal obligations, rather than increasing expected penalties. In the long-run, Agencies may adopt new monetization methods, perhaps through advertising or the provision of other data-based services. Finally, copyright holders may aspire to use digital technologies in creative ways to learn about demand, because among all potential users, an inadvertent infringer may turn out to be the next paying customer.

REFERENCES

- Athey, S., and S. Stern.** 2015. “The Nature and Incidence of Software Piracy: Evidence from Windows.” In *Economic Analysis of the Digital Economy*, ed. A. Goldfarb, S. Greenstein and C. Tucker, 443–477. The University of Chicago Press.
- Bebchuk, L.A.** 1984. “Litigation and settlement under imperfect information.” *RAND Journal of Economics*, 15: 404–415.
- Belleflamme, Paul, and Martin Peitz.** 2012. “Digital piracy: theory.” In *The Oxford Handbook of the Digital Economy*, ed. M. Peitz and J. Waldfogel, 489–530. Oxford University Press.
- Depoorter, B.** 2014. “Intellectual Property Infringements and 3D Printing: Decentralized Piracy.” *Hastings Law Journal*, 65: 1483–1503.
- Depoorter, B., S. Vanneste, and A. Van Hiel.** 2011. “Copyright backlash.” *Southern California Law Review*, 84: 1251–1292.
- Feld, Lars P., and Bruno S. Frey.** 2002. “Trust Breeds Trust: How Taxpayers Are Treated.” *Economics of Governance*, 3: 87–99.
- Kahneman, D., and A. Tversky.** 1979. “Prospect theory: An analysis of decision under risk.” *Econometrica*, 47: 263–291.
- Luo, H., and J. H. Mortimer.** 2015. “Copyright Enforcement: Evidence from Two Field Experiments.” Working Paper.
- Mortimer, J. H.** 2007. “Price Discrimination, Copyright Law, and Technological Innovation: Evidence from the Introduction of DVDs.” *Quarterly Journal of Economics*, 122: 1307–1350.
- Mortimer, J. H., C. Nosko, and A. Sorensen.** 2012. “Supply Responses to Digital Distribution: Recorded Music and Live Performances.” *Information Economics and Policy*, 24: 3–14.
- Oberholzer-Gee, F., and K. Strumpf.** 2007. “The Effect of File Sharing on Record Sales: An Empirical Analysis.” *Journal of Political Economy*, 115: 1–42.
- Waldfogel, Joel.** 2012. “Digital piracy: empirics.” In *The Oxford Handbook of the Digital Economy*, ed. M. Peitz and J. Waldfogel, 512–46. Oxford University Press.
- Athey, S., and S. Stern.** 2015. “The Nature and Incidence of Software Piracy: Evidence from Windows.” In *Economic Analysis of the Digital Economy*, ed. A. Goldfarb, S. Greenstein and C. Tucker, 443–477. The University of Chicago Press.

that the photographer needs to be compensated for work encourages settlement.

¹⁶See Depoorter, Vanneste and Van Hiel (2011) for a related discussion of these issues.

¹⁷See Mortimer (2007) for the use of price discrimination in addressing limitations of copyright protection, and Athey and Stern (2015) on piracy and versioning in software.