

Transactions costs and copyright

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Copyright and information explosion

- Copyright compared to patents
 - Length: “20 years” v “life of author + 70 years”
 - Breadth: “claims asserted in patent” v “expression of ideas”
 - Height: “non-obvious to one skilled in the art” v “spark of creativity”
 - Registration: patents must be registered, creative works subject copyright at time of creation
 - Information explosion
 - Nordhaus: cost of computation has fallen by 1-5 trillion times since 1900
 - Information production and consumption: Lyman and Varian estimate that in 2003, the world produced 5 billion gigabytes (5 exabytes) of information. UCSD study says 2009 consumption per person is 34 gigabytes per day.
 - Implications
 - Content has become cheaper to **produce** and **reproduce** leading to dramatic increase in
 - Professionally-created digital content: web pages, books, music, photos, videos all now “born digital”
 - User-created digital content: blogs, YouTube, Wikipedia, Flickr, Facebook
 - Pirated digital content: text, music, video, etc.
 - Copyright features + information explosion lead to
 - Huge transactions costs in managing legitimate transactions in copyrighted material
 - Increased concern about illegitimate use of content
 - Increased interest in technology for identifying, finding, purchasing, and licensing content
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Copyright term extensions

- United States copyright term extensions
 - 1790: 14+14; 1831: 28+14; 1909: 28+28; 1976: life + 50; 1998: life + 70
 - Is 100+ years “a limited time” as described in US Constitution?
 - Impact on incentives of extension is very small. At 7% rate of interest, extending term from 80 to 100 years is worth only 0.33% of value in first 80 years, assuming constant flow of royalties (which is very optimistic)
 - Only 11% of copyrights between 1883 and 1964 were renewed
 - Of 10,027 books published in 1930 only 174 were in print in 2001
 - Extension has no incentive effect whatsoever on pre-existing works
 - Only motivation to extend copyright came from the fact that it covered pre-existing works
 - Implications of extended term
 - More difficult to identify rights holders – could be modified by subsequent contract, owned by heirs, transferred, etc. Orphan works problem: “owner” may be unknown or ambiguous
 - Written works are problematic, photos and other media even more so
 - Proposed orphan works legislation by US Copyright Office 2008 laid out model legislation for “orphan works problem”
 - My goal: examine this model from an economic perspective
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Proposed orphan works legislation summary

Definition of “orphan works problem” --- a situation where the owner of a copyrighted work cannot be identified and located by someone who wishes to make use of the work in a manner that requires permission of the copyright owner.

Potential user must conduct a “reasonably diligent search” to identify rights holders. Important factors in determining whether a search is “reasonably diligent” include

- Existence of identifying material in work
 - Has work been made available to public
 - Age of work
 - Existence of publicly available records
 - Whether author is still alive
- If a “reasonably diligent search” has been conducted and owner cannot be identified, then work may be used
 - If author later steps forward...
 - Can only receive “reasonable compensation for use”
 - Interpretation: what would have been agreed to in an ex ante negotiation
 - Possible time window on compensation (e.g., last 5 years)
 - Injunctions cannot be issued for derivative works that includes “significant expression of user”
 - E.g., a single photo in a book with hundreds of pages, movie made from a book
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Two kinds of orphan works

Orphan works

“True orphan” works: rights holder is unknown (or unknowable)

Example: uncredited photograph, anonymous blog post

“Neglected” works: current rights holder is ambiguous

Book has copyright owner identified

But possible or even likely that rights have been transferred

“Reversion to author” clause in contract; 35 year termination rights

Death of author

Subsequent contract transferring rights

Two types of possible infringement

Can't find rights holder, but use anyway

Someone claims rights erroneously and licenses work

Publisher – despite reversion clause

Heir – without notifying other heirs or in ignorance of other contracts

Many heirs – coordination problem

Implication: Current owner (rights holder) may be very difficult to identify. In economic terms: search costs (a form of transactions costs) can be large..

Economic analysis of orphan works

- Three problems
 - Search externality
 - Seeking to be injured
 - Pricing holdup
- Basic framework: Identify economic value of licensing transactions
 - Benefit to buyer: value – price – buyer's search effort to engage in transaction
 - Benefit to seller: price – cost – seller's search effort to engage in transaction
 - Benefit to society: value – cost – buyer's search effort – seller's search effort
- Explicit model

$P(e_b, e_s)$ = probability transaction takes place

Expected payoff to buyer = $P(e_b, e_s) [v - p] - c_b e_b$

Expected payoff to seller = $P(e_b, e_s) [p - c] - c_s e_s$

Expected payoff to both = $P(e_b, e_s) [v - c] - c_b e_b - c_s e_s$

Individually optimal vs socially optimal search

Observation: Buyers and sellers will invest too little in search from a social perspective

Why? Each party has incentive to manage its own search costs, but the probability that a transaction occurs depends on *both* parties' search costs. Each has an incentive to free ride on other's search.

Efficient allocation requires that parties “internalize” the others' cost. The party who can do the most efficient search (in benefit – cost terms) will generally do more of it in the socially optimal outcome

Example: DMCA takedown provision. Makes sense since the rights holder has a much lower cost in identifying work than other parties. (As noted by King Solomon.)

Of course, technologies that lower everyone's search costs can make everyone better off.

Example: You Tube Content ID

Voluntary system created by YT with input from music publishers.

- 1) Owners submit their content to YT and identify desired policy (monetize, track, or block)
- 2) YouTube digitally analyzes submitted content and creates a Content ID which is robust wrt distortion
- 3) Music and videos that are uploaded are scanned to see if they match the Content ID. If so, YT carries out the owner's stated policy

Division of search effort: content owners assert ownership and submit content to YouTube. YouTube voluntarily developed system to assist content owners in identifying subsequent uses of content.

Result: every major US broadcaster, movie studio and record label use this system, along with thousands of copyright owners covering millions of pieces of content. YouTube Insight can track use using Content ID, adding capability for marketing and monetization.

This is an ad hoc solution but shows what can be done. Is it a good idea to have a voluntary, industry-wide standardized system for content recognition?

But note: a single, standardized system would have disadvantage of presenting a fixed target to hackers. Is there a role for genetic diversity? As with encryption standards, it depends on how good a system can be developed and how rapidly it can evolve. Be careful of “premature standardization”.

Other implications of search effort externality

Recall setup: each side pays its own search cost, but there is a value to both if a transaction takes place

Expected payoff to buyer = $P(e_b, e_s) [v - p] - c_b e_b$

Expected payoff to seller = $P(e_b, e_s) [p - c] - c_s e_s$

Expected payoff to both = $P(e_b, e_s) [v - c] - c_b e_b - c_s e_s$

Too little effort takes place from societal point of view

Similar to tort law: 1) with no liability person only bears their own cost of accident, so each does not exert enough care to avoid an accident, 2) ideally the least cost avoider should bear more of the cost in case of accident

Solution in tort law is liability: if you meet due care standard, you escape liability, otherwise have to pay cost of accident. (See Shavell (1987).)

Analogous concept in orphan works proposal is “diligent search”. If you undertake diligent search, you avoid liability, otherwise may be subject to copyright infringement damages

Role for institutions and technologies to help reduce search costs

Institutions: Markets, exchanges, registries, clearing houses, search engines

Technology: Identification tools such as content recognition, watermarks, fingerprints

Legal: Appropriate assignment of responsibilities in order to encourage transactions

What can go wrong with search?

It may not be clear who currently owns a particular piece of intellectual property (neglected works)

Could make a rule that IP can be used *only* if owner can be explicitly identified

But this would be highly inefficient. If owner really can't be found, then default should be that use is allowed since the transactions are valuable

It may not be obvious to a party that it owns the property in question

Out-of-print reversion to author clauses in book contracts

Private contracts may subsequently override initial assignment of property rights

Estates and heirs may have joint ownership

Asserting ownership incorrectly could, in principle, be highly costly due to damages (statutory damages go as high as \$150,000 per work).

Given these ambiguities, there has to be a safe harbor (such as “diligent search”) for the same reason you have “due care” in liability suits --- unlimited liability would lead to too few transactions.

There may also be an incentive to seek to be injured.

If damages are very large, IP owner may not want to be found.

Example: submarine patents, treble damages in antitrust law

Need to think carefully about structure of damages due to conflicting principles

If difficult to catch violators, want a large penalty

Large penalty could discourage legitimate use cases due to ownership ambiguity

Summary of potential problems from search cost

For physical goods, we normally think buyers and sellers want to find each other because exchange can only take place if they do find each other

Why is IP different? Why would they want to avoid finding each other?

Buyer

Want to avoid search cost (want search cost to be low)

May want to avoid payment and infringe (requires some expected cost of infringing)

Seller

Want to avoid search cost (want search cost to be low)

Want to avoid erroneous claim of ownership (requires some safe harbor).

May want to seek injury (requires some cost/reduced benefits from failing to be found)

How proposed legislation deals with these problems

Buyer

Receives expected benefits from a diligent search: e.g., can use IP if unable to locate owner.

Bears costs from failing to conduct a diligent search: e.g., infringement damages

Seller

Has to receive expected benefits from being easy to find; e.g., transaction takes place, rights holder is compensated

Has to bear costs from being hard to find; e.g., likelihood of potential transaction is diminished

Proposed legislation says relief limited to “reasonable compensation” (e.g., terms that would be agreed upon ex ante.) Also, limits on injunctive relief for derived works.

Costs from erroneously asserting ownership should be small (which may require different form of safe harbor). E.g., “good reason to believe” you are owner. Want to be liberal with this (so transactions take place) for 2 reasons: 1) want rights holders to register, 2) want work to be used. Could use some form of lightweight arbitration. (Solomon again.)

What should constitute a diligent search?

Most problems can be solved with a registry (or clearinghouse), since “search costs” can be made very low. Example: history of course packs and Copyright Clearance Center in US. (Registry identifies owner, clearing house facilitates transaction.)

Suppose courts interpret searching the registry/clearinghouse as “diligent search”

The rights holders have incentive to register their material as long as there are:

- Limited damages in case of error (neglected works problem)

- Minimal rewards to “submarine copyright” (seeking to be injured)

Since a registry (and/or clearinghouse) is the obvious solution, who could object?

- Buyer is exposed to more content, leading to more competition and Bertrand pricing is a danger. Example: royalty-free stock photos, Flickr

- Seller (or buyer) may feel their negotiation skills give them an advantage

- Existing intermediaries (agents) may feel threatened

- Practical question: who should manage registry (or clearinghouse) and how should it be paid for? For clearinghouse, industry is more natural than government.

Network effects with clearinghouses

Network effect

Network effect: Buyers want to be where there are many sellers, sellers want to be where there are many buyers

Congestion effect: Buyers want to be where there are few other buyers, and sellers want to be where there are few other sellers

Normally the first effect trumps and small number of markets form

Financial markets, eBay, merchant clustering in neighborhoods

Thicker markets are better for buyers, not always for sellers

Possible issues for clearinghouse

May be a price monitoring/collusion story in some cases via signaling mechanisms (Sabre, NASDAQ)

So oversight may be warranted

Algorithmic pricing is required for “true orphan” works. But algorithms are potentially open to inspection unlike other pricing mechanism, so easy to identify collusive algorithm.

Is a uniform minimum price collusion? Would be weird given Bertrand model.

What about other forms of pricing? 1 song = 99 cents, 5 songs for \$3.99

Universal registry summary

Buyers

- Avoid infringement costs (but now no excuse for infringement)

- Benefit from competition among content providers

- Reduce search and negotiation costs

Sellers

- “Seeking to be injured” problem mitigated

- Potential costs of asserting ownership if incorrect

 - Want a liberal policy to encourage transactions and registration

- Increases competition from both buyers and sellers

- Reduce negotiation costs

Orphan works

- Virtually anything is an improvement on status quo

Outline of model

Suppose using registry requires effort cost e_b^* for buyer and e_s^* for seller. Suppose that if both use registry, work is found with probability 1 but either one doesn't use registry work has probability 0 of being found.

Assume that value of transaction is positive and that there are no production costs for simplicity: i.e., $v - e_b^* - e_s^* > 0$. Then we want to ensure that registering is more profitable than not registering.

For (potential) buyer, there should be sufficient expected fine so that he is better off conducting a diligent search using registry than not doing so:

$$v - p - e_b^* > v - \text{cost of infringement}$$

For the seller there should be an expectation of profit that exceeds the cost of not registering (i.e., no submarine copyrights).

$$p - e_s^* > \text{expected rewards if no registration}$$

Obviously want a) costs of infringement to be large enough that searching registry and licensing is preferred choice and b) expected benefit from not registering is as small as possible and c) search costs as small as possible

Holdup: why clearinghouse is better than registry

- If buyer can find seller, a transaction may take place. But at what price?
 - Is price known before search commences, or determined (by negotiation) after seller found?
 - If known before, buyer can compare expected benefits + search costs
 - If only known after, seller can (sometimes) extract all surplus, particularly if search is costly
 - Extreme case: identical value for item, can only find price by visit (Diamond model)
 - Equilibrium is full monopoly price
 - Each seller finds it profitable to increase price by less than transactions cost
 - All prices get pushed to monopoly price
 - In general, expect large search costs to push prices up (evidence from price advertising)
 - Hold up problem
 - Search costs are a sunk cost
 - The seller doesn't care that I conducted a “diligent search”
 - But if I am charged my reservation price, the expected surplus + search costs could be negative --- discouraging potential buyers. Cable TV and net neutrality example.
 - Solution: clearing house (+ registry) with posted prices known in advance
 - E.g., mechanical reproduction fee (fixed price per song), ASCAP fees, etc.
 - Second degree price discrimination (i.e., public menu with quantity/quality discounts) is also feasible (though hard to standardize and danger from premature standardization)
 - Itunes: original 99 cent model or the (69, 99, 129 cent) model
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Transactions cost approach to opt-in v opt-out

- Mass digitization
 - Opt-in: work available unless request being out
 - Opt-out: are unavailable unless request being in
 - Who notifies whom?
 - Critical question
 - How hard is it to identify copyright owner
 - For aggregator?
 - For owner?
 - Digital Millennium Copyright Act rightly puts the responsibility on owner (similar to liability resting on the least-cost avoider)
 - Technological fixes such as content recognition, fingerprinting, watermarking are voluntary
 - What if responsibility for identification were assigned to aggregator?
 - Seeking to be injured problem (as with submarine patents)
 - Liability of erroneously or falsely claiming ownership
 - Transactions costs of notification would overwhelm the aggregator
 - Imagine problems with WWW in an opt-in regime! It would never have happened.
 - Same thing is true of scanning programs
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