

# “A Comparative Institutional Analysis of Intellectual Property and Open Source in Biotechnology”

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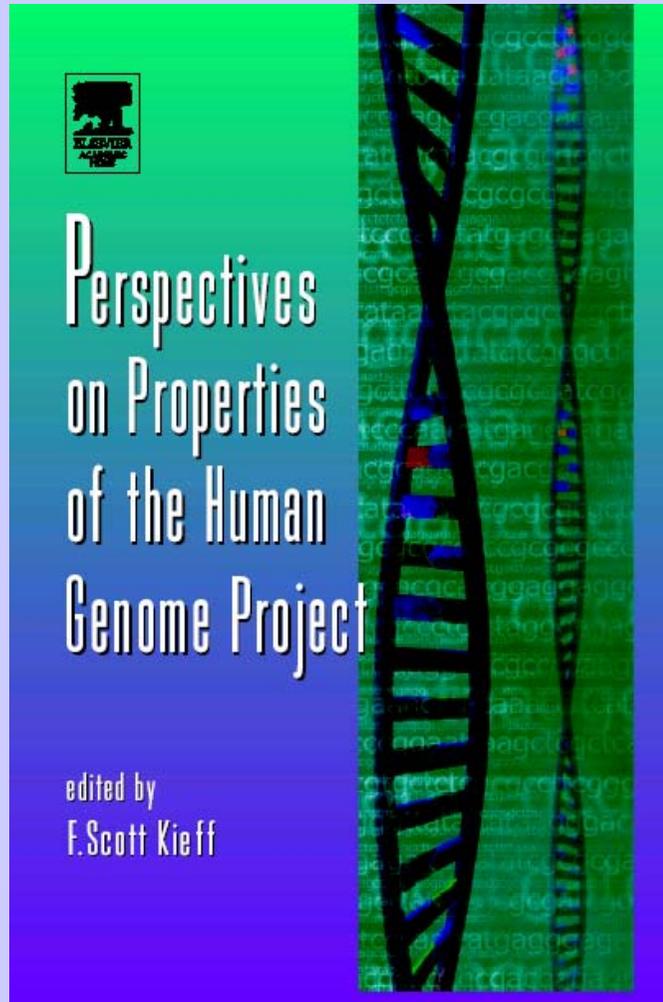
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# New Book: “Perspectives on Properties of the Human Genome Project”



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# Overview

- Motivation: better understand why we are so dissatisfied with IP institutions
- Intuition: we have long been overlooking a key role these institutions can play
  - This role is coordination
  - Coordination among the many complementary users of an asset so as to get the asset put to best use
  - We instead focus on direct incentives and end up frustrating coordination
  - Ironically, we also focus on mitigating transaction costs and monopoly effects but make them worse
- When we think about coordination as a goal IP can achieve effectively and efficiently we
  - Contrast alternative goals relating to externalities, rent dissipation, and direct incentives
  - Contrast alternative institutions for achieving this goal including fame, families, firms, and government
- We also see this is consistent with several recent trends in the literature about the theory of property in general
- We then can see some important lessons for how to think about IP going forward

# Approaches to Research I: NIE as a Theoretical Approach

- 1993 Nobel Prize to North and Fogel for work on NIE
  - Focus on impact on economic development of institutions as compared with other parameters like capital, labor, and technology
  - “Institutions” are taken to be all humanly devised constraints on human interaction including formal laws, rules, and informal norms, and their enforcement characteristics
  - Unlike old IE, endeavors to characterize impact: not just “law matters” or “institutions matter” but a research agenda to determine how they matter
- 1991 Nobel Prize to Coase on Theory of Firm
  - Transaction Costs and Agency Costs
- Comparative institutional analysis
  - All institutions have problems
  - Demsetz: nirvana fallacy / Voltaire: “The perfect is the enemy of the good”
  - Dewey: “The better is too often the enemy of the still better”
- Choices: Legal institutions are endogenous – we can change them if we want, so we must ask: what do we want, what works better?

# Emerging Theories on Emergence of Property Rights

- Externalities
  - Pigou: taxes and subsidies
  - Coase: reciprocity, and transaction costs
  - Demsetz: property emerges when benefits of internalization outweigh transaction costs of recognition (too much hunting, too little animal husbandry)
- But how? Coordination among complementary users, centralized control
  - Against background of Coase and Williamson on theory of the firm and hierarchy
  - Property can work too...

# Emerging Theories on Mitigating the Problems of Property Rights

- Rent dissipation and government allocations
  - Stigler: concentrated benefits and diffuse costs explain how it happens
  - Buchanan and Tullock – explains how competition for this can cause waste
  - De Soto, McChesney, Schleifer – explain how competition among government actors can cause further waste (tollbooth theory)
  - Friedman – explains how “mission creep” by other government actors leads to additional tollbooths
  - Anderson and Hill – explain how to solve with claiming by residual claimants
- Transaction costs (including search, inspection, other information, contracting, execution, control, and enforcement, professionals to help, and asset specificity and opportunism)
  - Transaction benefits
    - Gains from trade for those transactions that are good
    - specialization and division of labor, socialization
  - Transaction cost engineers
  - Thin markets vs. thick markets
  - Political markets vs. economic markets
- Monopolies
  - But define market – mousetraps or mouse-abatement?
  - Output restrictions, not price increases
  - Price discrimination

# Popular Theories of IP – Reward Theories I

- Most of the literature sees IP as rewards and frets about what many call the “incentive access paradigm”
  - Targeted incentives to specific individuals to invent or create as a solution to problem of positive externalities
    - Worry about “tragedy of the commons” problem
  - But then targeted responses to problems of monopoly distortions, transaction costs, behavioralism, and anticommons
    - Liability rules
    - Enhanced antitrust regulation
  - The problem is seen as an impossible choice between a tragedy of the commons and a tragedy of the anticommons
  - The solution that is offered is Pigouvian subsidy and increased regulation

# Popular Theories of IP – Reward Theories II

- Problems of Reward Theories
  - Imprudent incentives
    - Not needed to the extent enough happens otherwise (like positive externalities of gardens)
    - Not effective if desired activity is not responsive to additional reward (fame, etc)
    - Not able to be tied to merit (screening problems, assumes 1-to-1 with markets)
    - Fails to explain positive law outline (e.g., we don't ask whether inventions are good we ask if they are new)
  - Ineffective access
    - Property rights can facilitate access through coordination among complementary users: inventors, investors, managers, laborers, advertisers, marketers
    - Liability rules are offered to mitigate hold out problems, transaction costs, behavioralism, anticommons
      - But as Robert Merges points out under Calabresi-Melamed test property rule treatment makes sense because information needed to value IP is more cheaply obtained and evaluated by private parties than courts
      - There will be failed coordination among infringers which gives rise to its own rent dissipation of the benefits of use
      - As David Haddock, Fred McChesney and Menachem Spiegel point out, discourages investment in the subject matter itself *ex ante* – frustrates private ordering
      - There is always some liability rule effect: corporate law; bankruptcy law; costs, uncertainty, and delay of litigation, and government immunity
    - Inaccurate history: Giles Rich and '52 Act (at least for patents, goal is NOT incentive to invent)

# Popular Theories of IP – Prospect Theories

- IP as prospects to mitigate rent dissipation
  - Overinvestment impact of racing
  - Improper investment impact of racing (public choice)
  - Property as tools for coordinating among *competing* users to avoid rent dissipation
- Problems with prospect theories
  - Rent dissipation may not be a problem for IP
    - Not a single prize
    - Increased competition may generate more
      - 1987 Nobel Robert Solow – economic growth due more to investments in R&D than in K&L
      - Paul Romer – investments in R&D do not experience decreasing returns to scale
  - IP rights are likely to be ineffective in mitigating the rent dissipation that does occur
    - Stronger rights may facilitate *ex post* coordination but will increase *ex ante* rent seeking
    - Edmund Kitch suggests *ex ante* will be easy to coordinate because a smaller community
    - Michael Abramowicz points out then there may be more cognitive biases
    - It also may be harder to find each other (nascent ill-defined field) or to talk to each other (Arrow Information Paradox)
  - As with the reward theory, the prospect or rent-dissipation theory fails to explain the positive law IP framework

# Commercialization Theory I

(Kieff, *Property Rights and Property Rules for Commercializing Inventions*,  
85 Minn. L. Rev. 697 (2001))

- IP backed by property rights and property rules as one option for facilitating coordination among complementary users of the asset that is protected
  - Publicly recorded ownership serves as beacon to draw them together
  - Property rules help them negotiate with each other (Arrow Information Paradox) – a coordinate downstream commercialization
  - Facilitates both diversity and socialization
- This turns out to be historically accurate – this is what motivated present U.S. patent system ('52 Act).

# Property Rights in IP vs. other Institutions I

- Contracts across open market
  - Benefits
    - Strong incentives
  - Costs
    - Coordination problems
- Families, guilds, and other close-knit communities of friendship, ethnic, or religious bonds
  - Benefits
    - Centralized control can coordinate
    - Can rely on informal norms rather than formal rules
    - Enforcement and other administrative costs can be lower
    - Enforcement can be more predictable and more effective
  - Costs
    - crony capitalism, asset specificity and opportunism, decreased diversity, no strangers,
- Fame
  - Benefits
    - Any beacon can coordinate
  - Costs
    - Not widely accessible, not predictable
    - Less tradable, bundle-able, and divisible
  - Consider Linus Torvalds and Linux

# Property Rights in IP vs. other Institutions II

- Firms
  - Benefits
    - Centralized control can coordinate
    - Can decrease transaction costs by bringing transacting parties under one roof,
  - Costs
    - agency costs, asset specificity and opportunism
    - hierarchy is a particular problem for innovation
      - Managers don't know what the innovators really do
      - Innovators don't get full credit but face full risk
- Government
  - Benefits
    - Centralized control can coordinate
    - Can avoid many market failures of transaction costs, externalities (Pigou) etc.
  - Costs
    - Same as firm plus:
    - Information costs and P versus V (Unlike price, votes do not reflect intensity of preferences and votes do not reflect relative preferences because they are not fungible except among the actual candidates on a ballot )
    - Public choice problems of agency capture, toll booth theory (stem cell example in CA)

# Property Rights in IP vs. other Institutions III

- Property rights are just one way – one option – for coordination
  - Publicly recorded ownership serves as beacon to draw them together
  - Property rules help them negotiate with each other (Arrow Information Paradox)
  - Facilitates both diversity and socialization
  - Strong incentives of a market
  - Avoid problems of a firm: weak incentives, agency costs, administrative costs, decreased innovation, asset specificity and opportunism
  - Avoid problems of family: crony capitalism, asset specificity, no strangers, decreased diversity
  - Avoid problems of government: transaction costs, administrative costs, agency costs, public choice costs etc.
- To work effectively they must be easy to negotiate around, and over
  - Must be clear – know what they are
  - Must be certain – know what they will be
  - Must have an owner, who is a residual claimant
  - Must be divisible and bundle-able
- To work efficiently
  - Must mitigate information costs
    - who is lowest cost provider and evaluator?
  - Must mitigate asset specificity and opportunism
    - if patents covered the prior art then there would be hold-ups
  - Must mitigate rent seeking and rent dissipation especially in connection with public choice – so let the property owner stake out the claim and make him live with what is staked out

# Implications for IP – Commercialization Theory II

- Common misperceptions of the theory in particular and IP in general
  - Prospect or rent dissipation theories focus on coordination among *competing* users to decrease use but commercialization theory focuses on coordination among *complementary* users to *increase* use
  - Demsetz focused on property to internalize externalities but commercialization theory sees property rights as tools for coordination
    - after commercialization theory but independently Demsetz also shifts focus to coordination
    - There is a symmetry in the problems of free riding because of externalities for a commons and of rent dissipation towards a common prize: coordination
  - Unlike Schumpeter who sees property owner as one who must control coordination, commercialization view recognizes control will go to one with strongest bargaining power (often may be VC, not inventor)
  - Unlike Lemley, focus is not on *ex ante* invention stage (if anything it is on *ex post* the invention stage), instead the focus is on *ex ante* any decision by any of the players to facilitate private ordering

# Implications for IP – Commercialization Theory III

- Overlooked Solutions to Social Costs of Property Rights in IP
  - Behavioralism (judges, administrators, and legislators are boundedly rational too, plus public choice problems)
  - Monopoly concerns backwards when considering patents as tools for facilitating market entry
    - (David v. Goliath, Microsoft)
    - Price discrimination (basics matters)
  - Transaction costs and biotech
    - (market for Kudos v. market for Kudos plus cash and the pool of ~1,400 small and medium sized firms since 1980)
    - Consider transaction costs of Coke machines and reagent freezers
  - Anticommons and public choice (upstream v. downstream, who infringes a useless patent? It all makes no sense and if doors are open we should not be surprised to see claims, leading to License Raj, or IBM, Kieretsu Strategy)

# Eisenberg, et al. – Patents Can Frustrate

- Pre-1980, norms discouraged property
- 1980 triggered new selfish behavior
- Patents can frustrate exchanges among members of the basic science community
  - Transaction costs
    - Cognitive biases, holdouts, lawyers, etc.
  - Decreased efficiency
    - More time, more money, fewer transactions

# Patents Can Facilitate

(See Kieff, *Facilitating Scientific Research: Intellectual Property Rights and the Norms of Science - A Response to Rai & Eisenberg*, 95 NW. U. L. Rev. 691 (2001))

- Pre-1980, norms encouraged property
  - Judge-made positive law institutional framework
  - Stratification and kudos (Ravetz)
- Patents can facilitate exchanges among members of the basic science community
  - Increase wealth
  - Increase diversity
- 1980 triggered huge increase in access for public
  - New pool of ~1,400 small and medium companies
  - Pool is unique to US and unique to post-1980 period

# Lessons from “Anticommons” in IP and Real Property Literatures

- Heller on “anticommons” in the post-socialist environment argues that if too many people can say “no” to a use, that use may not come about
- But that explanation is not entirely correct
  - Numbers of players do increase transactions costs
  - But at least as important for post-socialist property is
    - Lack of ability to openly extract value for saying “yes” (lack of residual claim on that right of exclusion)
    - Lack of clarity in that right of exclusion – who do you go to for a “yes” and what do you say?
    - Lack of certainty in that right of exclusion – is “yes” needed, and does “yes” really mean “yes”
    - Lack of any market – some “no” votes are only of value so long as they are “no,” and never of value as a “yes”
      - Mission actually is important
      - Mission just seems important – a zealot
      - Mission is just an excuse – a “jerk”
  - Just like what Epstein wrote on the problem of permit thickets
  - Just like in India after British Rule when replacing “Raj” with “License Raj”
- Compare patents, which can be clear, certain, owned by a residual claimant, and openly tradable

# Implications for Further Research:

## Data on Deploying Research Tool Innovations

- Query: what are the real mechanisms by which the attempted exchanges among members of the basic science community are attempted and the mechanisms that work and those that fail
  - Data set based on survey about the transactions themselves
    - Who tries for the transactions – academic, private, funding? Gender, age etc
    - Who actually negotiates – scientist, lawyer, forms, drafted, phone, email, repeat players etc
    - What results – go ahead anyway, sue, stop work, invent around
- Different answers might suggest different responses
  - Hassles might be high – e.g., telemarketers – so perhaps a clearing house like ASCAP, BMI, CCC
  - Too many suits being won so maybe law needs changing for an experimental or pro bono use exemption
  - Maybe perceptions are wrong about suits, so educate property owners (compare NYC) and infringers.

# Preliminary Thoughts on Comparing National Regimes

- Implications of Development Agenda
  - Who is behind new initiatives?
    - Holders of biodiversity inputs (upstream of those patents)
    - Having developed manufacturing organizations (for whom the patents are upstream)
    - India, Argentina, Brazil
    - What about sub-Saharan Africa etc?
- Implications for varying local institutions
  - If strong courts, perhaps register and litigate
  - If not, perhaps improve examination

# Conclusion: Inviting Follow-up

- New project on “Institutions and Technology Development”
  - Law
    - IP
    - Corporate/securities
    - Contract
  - Economics
    - Finance
    - Industrial Organization
  - Sectors
    - Public: government and academic
    - Private
  - Modes of action
    - Basic research
    - Expert consulting/testifying
    - Grants – give and receive
    - Most importantly....collaborations

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