

The Chicago Intellectual Property Rights Tradition and the Reconciliation of Coase and Hayek

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In this paper I trace a fairly continuous line of argument about the institutional mechanisms by which intellectual property is produced and maintained in an advanced, commercial economy.¹ The better part of the economic thinking on this subject owes directly to an approach to policy analysis advocated by Ronald Coase.² Coase's ideas influenced a number of talented economists especially after his arrival at the Law School in 1964. I speak of a "Chicago intellectual property rights tradition" not only because of the splendid bouquet of ideas at the law school proper, but also because of the cross-fertilization that took place between the lawyers and several economists on the Chicago economics faculty.³

The enigma of intellectual property can be summarized quite simply this way: Since commercially valuable information can be kept proprietary only for limited periods of time, how is it that so many individuals and businesses are at work producing this information each day? Somehow they must benefit from producing valuable information, either by the lead time advantage they gain over competitors before this information becomes generally available to other firms or else by somehow keeping this information from being utilized by other competing firms. Surely, other firms must be discouraged from copying or at least copying without permission from the original information "owner." How do information-producers establish their proprietary interests in the first place? How do they protect their intellectual harvests from would-be poachers who wish to free-ride on the first information-producer's often costly investments?⁴

To appreciate the contribution of the "Chicago tradition," toward the unraveling of this puzzle, I have organized my discussion in three main parts. In Part I, I emphasize Aaron Director's role both in inaugurating a field of research in law and economics at Chicago and in pioneering a particular methodology for accomplishing that task. Director and his students literally paved the way for Coase and the celebrated property-rights approach to policy analysis.⁵

As I demonstrate in Part II, Coase's students, especially Harold Demsetz and Steven Cheung, applied Coase's thesis to the problem of the production and profitable distribution of business information.⁶ The Coase group broke new ground. They systematically applied a method which they called "comparative institution analysis" to the problem of intellectual property.⁷

I also survey Edmund Kitch's work, which utilizes the basic logic of the Chicago human capital approach in order to reach a surprising result about the effectiveness of the division of knowledge and the organization of work within large business organizations.⁸

Finally, in Part III I show that the property rights approach applied to intellectual property helps us reconcile Friedrich A. Hayek's celebrated appreciation of the pricing system as a mechanism for quickly and effectively utilizing commercially valuable economic information with another of Coase's pioneering essays, namely, the one about the nature of the firm.⁹ To some extent the firm exists to retard the diffusion of commercially valuable information while, at the same time, effectively and "selfishly" utilizing that information for business gain. Whereas Hayek argued that, once property rights are

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established, information is most effectively utilized via the pricing system, the Chicago tradition stands for the proposition that the attenuation of the price system can, in some cases, facilitate both *the creation and utilization* of commercially valuable information. To the best of my knowledge, this proposed reconciliation of Coase and Hayek is original and has not been offered before.¹⁰

THE CHICAGO LAW SCHOOL APPROACH

Origins

As a rule, law school faculties do not employ professional economists to teach economics.¹¹ During the 1930s, Chicago's Law School violated this rule and actually hired a professional economist. Henry Simons was hired to teach economic principles to law students.¹² Simons's interest in preserving competition as a method of social regulation informed most of his policy prescriptions and provided fertile soil for the rooting of the Chicago law approach.¹³

Simons's untimely death in 1946 led to the appointment of a successor economist, Aaron Director.¹⁴ With Director we have the initiation of a genuinely novel and influential law and economics research program at Chicago. In a team-taught antitrust seminar with the distinguished lawyer, Edward Levi, Director encouraged the law students to inquire more deeply into what, at first glance, appeared to be suspicious, "exclusionary," business practices.¹⁵ Rather than stigmatize what they do not understand as "anticompetitive," lawyers should study suspicious business practices in order to discover the *function* they play in a modern commercial setting.

Levi would analyze the rhetorical methods the courts use to characterize and therefore distinguish lawful from unlawful behavior. Director, on the other hand, warned the law students to be skeptical about the court's rhetoric. Instead of semantic hairsplitting, lawyers should ask how an unlawful business practice could possibly enhance business profits.¹⁶ In the cases where the condemned business practice is not profitable nor likely to produce profits in the future, the lawyer is put into the embarrassing position of arguing that businessmen violate the antitrust laws by doing things that are truly unprofitable. Such a conclusion strains all credulity since it was the greed of businessmen that the law was designed to regulate in the first place!

In other cases, where the condemned business practice enhances business profits, Director applied the tools of economic analysis and found that the national product was increased along with the business profits. This meant that the condemnation of the business practice under the antitrust laws might serve to restrict market opportunities and diminish national wealth—once again, a disturbing result.¹⁷

Director's great contribution was to show the students that, in the absence of transaction cost considerations, so-called exclusionary practices were unprofitable to the businessman. In the presence of transaction costs, condemned business practices were profitable and helped achieve the important public policy objective of wealth creation.¹⁸

Judge Robert Bork, reflecting on his experiences in the Director-Levi course, stated that the course provided him with nothing less than a "new way of looking at the world."¹⁹ Milton Friedman emphasized the success Director had in pointing students to a new source of data for economists to investigate—the business practices discussed in the antitrust case law decisions.²⁰ Finally, Judge Richard Posner commented that Director actually succeeded in giving economists a new job to do—to prove the presence or absence of business conspiracy through the *actual* effects the suspicious behavior had in the market.²¹

Director called attention to the public policy errors that occur when legal analysis is applied to business behavior without the benefit of economic analysis. Director advocated the merger of legal studies with economic analysis, and that merger is now regarded as the hallmark of the law and economics approach.

Director's students responded to his challenge by publishing a spate of articles, several of which are considered to be landmarks in the law and economics literature that emerged from the Chicago Law

School program. In addition to Bork, other veterans of the Director-Levi seminar include John S. McGee, Lester Telser, Gary Becker and Ward S. Bowman, Jr.²²

Coase and Policy Analysis:

When Coase came to the Chicago Law School he enthusiastically assumed the responsibilities of editor of the *Journal of Law and Economics* (JLE).²³ Under Coase's direction, the JLE became the main research outlet for the law and economics movement, a status that has remained an important part of that journal's success for nearly three decades.

Coase's remarkable paper, "The Problem of Social Cost," appeared in the JLE in 1960 but had already set off a lively and far-reaching debate about policy among the economics faculty at Chicago.²⁴ The publication of the paper naturally publicized that debate and encouraged other commentary. Despite the many qualifications, extensions and refutations, what is commonly referred to as the "Coase theorem" has remained intact.

My concern in this section is with a narrower aspect of Coase's thesis, namely, those features of his argument that were directed against the policy analysis of A.C. Pigou.²⁵ The Pigouvian approach provided a simple recipe for direct government regulation of the economy that many economists were all too quick and eager to copy.²⁶ Pigou's recipe consisted of calling for government regulation whenever the privately perceived cost of an activity did not include the entire "social costs" of that activity. Again, a simple example will serve to illustrate the Pigouvian approach.

Consider the case of the six o'clock "Bolt Express" emitting sparks as it breezes by Mrs. O'Leary's outdoor laundry line and creating about \$40 a month in damages to her laundry. If we also learn that the railroad owners net only \$20 a month in profits, then we have a situation that makes the national product of this economy lower than it otherwise might be. It occurred to Pigou and many economists after him that a scientifically imposed (monthly) tax of \$40 on the railroad owners, which accrues each time the six o'clock "Bolt Express" roared by Mrs. O'Leary's wash, would set matters right.²⁷ The tax quickly educates the railroad owners about the true (marginal) costs of their activity. By confronting railroad owners with the true, "social cost" of the activity, they would be in a more precise position to decide whether to run that train at all. Since the tax has eliminated the profits on the six o'clock run, the railroad owners will stop running the six o'clock "Bolt Express." Now Mrs. O'Leary's laundry is saved from any further damage. Government intervention, especially if such intervention were not too expensive to administer, has helped increase the national product.

Coase demonstrated that this reasoning led to false conclusions about resource allocation. Pigou was correct in concentrating on the maximization of national output as the correct policy objective. He was also correct in focusing economists' attention on the problem of "economic damage" and trying to attach a dollar figure to that damage. Pigou erred in calling for direct government regulation in the form of a tax when alternative, perhaps more effective, social arrangements are possible. Let us examine Pigou's errors in more detail.

Suppose Mrs. O'Leary, at only a minor expense, could hang her wash *after* the six o'clock morning train had passed her backyard clothesline and that such an alteration in her normal, daily routine would be a minor inconvenience. So minor that a small monthly payment of \$5 from the railroad would be more than sufficient to compensate her for accommodating her wash schedule to the time-schedule of the railroad. The Pigouvian tax system, as described above, if implemented, would now *lower* national output below *what it might otherwise have been*. Rather than direct government regulation, perhaps we need only have had a (less expensive) local court declare that Mrs. O'Leary has a "legal right" not to have her laundry damaged (or threatened with damage) by the early morning six o'clock "Bolt Express." The railroad company, confronted by the court's decision, must now "purchase" Mrs. O'Leary's consent.²⁸ The railroad might secure her voluntary consent and in this way obtain the right to run a train by her house. If the costs of negotiating and enforcing such an agreement were small enough, such a contractual arrangement would emerge, and the value of the economic product would expand.

The Coase theorem emerged from the observation that, under certain, special circumstances, it

would not make a difference in terms of the allocation of resources and the size of the subsequent national produce, whether or not Mrs. O'Leary were awarded the right not to have her laundry invaded by escaping sparks or, in the alternative, the railroad owners were provided with the right of way and allowed to emit those sparks. If it were the railroad owners who won the lawsuit, then it would be Mrs. O'Leary who might have to make an offer to the railroad company to stop running the six o'clock express. Coase explained that, as long as the costs of transacting business between the parties were small, private negotiation would succeed in maximizing national wealth. Private negotiation about the use of property rights requires, first of all, well-defined property rights structures.

This surprising and now celebrated result that is a matter of indifference to an economist as to which of the two parties in a damage-dispute is declared to be liable for damages, derived mostly (as Coase explained) from the simplifying assumption that the transaction costs of arriving at agreements about resource use are negligible. In a world where accountants must perform audits and lawyers charge for preparing contracts, it often does make a dramatic difference which of two disputing parties wins a lawsuit. In fact, Coase explained that, from the economic point of view, it is best if the judge decides against the party who can avoid the damage at the lowest cost. Indeed, as Coase's survey of private nuisance actions revealed, judges often did decide cases in precisely this way.²⁹

Pigou's earlier tax-the-harm approach embodies an important, analytic error. The tax levied on the perpetrators of the damage-producing activity (that is, the owners of the railroad) results in tax revenues that are not thereby redistributed to the victim (that is, Mrs. O'Leary). Thus, the victim is faced with an extreme choice of either permitting the activity of her neighbor (the six o'clock "Bolt Express") or else trying to ban the activity altogether. The range of intermediate solutions, such as letting the harmful activity continue, but only for a while and up to a point are eliminated by the pattern of the government intervention Pigou recommended. The Pigouvian approach to the problem of welfare economics was, Coase argued, "defective." It was defective because the Pigouvian approach failed to consider the opportunities that are foregone when direct government regulation, such as a tax, is used rather than, say, the clarification of property rights by the judges.³⁰

Coase's message was simple: Economists should apply the idea of opportunity cost as consistently in the area of normative policy analysis as it is applied to the study of the firm in the market place. The typical business organization compares one intended application of resources with what they could produce when productively employed elsewhere either within the firm or elsewhere in the economy. These calculations are based on market prices and, as Coase explained:

The main advantage of the pricing system is that it leads to the employment of factors in places where the value of the product yielded is greatest and does so at less cost than alternative systems. . . .³¹

By analogy the policy analyst should stop comparing current market outcomes to the so-called ideal of perfect competition since the ideal of perfect competition is, as its name suggests, an ideal and not a realistic alternative. By definition and not by analysis, the current market outcome always appears to be inadequate, warranting the interventionist solution. A more fruitful approach would be to start with a situation that actually captures business practices as they exist and then examine the proposed policy change in order to decide whether the new situation would be, on balance, better or worse than the current situation. As Coase explained, the practical value of this approach would be that "conclusions for policy would [finally] have some relevance to the actual situation."³²

APPLICATION OF THE APPROACH TO INTELLECTUAL PROPERTY

Demsetz and Cheung

Harold Demsetz joined the Chicago economics department in 1963. He applied Coase's general line of reasoning to several important problems in modern economics, including the problem of the production and maintenance of commercially valuable business information.³³ Demsetz underscored the point that property rights structures were a necessary precondition in order that markets could

function to internalize (i.e., eliminate) troublesome externalities. The internalization of externalities would allow competitive market structures to maximize national product. It was the maximization of national product that remained for Demsetz (as it had for both Coase and Pigou) the overriding objective of economic policy analysis.³⁴

A primary function of property rights is that of guiding incentives to achieve a greater internalization of externalities. Every cost and benefit associated with social interdependencies is a potential externality. One condition is necessary to make costs and benefits externalities. The cost of a transaction in the rights between the parties (internalization) must exceed the gains from internalization. In general, transaction costs can be large relative to gains because of "natural" difficulties in trading or they can be large because of legal reasons.³⁵

In other words, if transactions costs were too high, it would make the adequate definition of property rights impossible, and individuals might simply fail to internalize the externalities, losing out in what might otherwise be mutually advantageous exchanges. These insights are nicely illustrated by the problem of the production and maintenance of intellectual property. Consider the peculiar problems associated with the financing of technological innovation.

The first problem has to do with the fact that most successful innovations are emphatically not the result of a flash of genius and spring out fully grown from the recesses of an inquiring genius' brain. Rather, the innovations are a product of hard work and excruciating mental effort.³⁶ At the start, there is the preliminary, basic research that, among other things, demonstrates the logical possibility of some quality or effect that subsequently may be determined to have commercial value. Then comes the process of inventing with all its pitfalls and varied experimentation. Finally, the process of developing the invention is long and treacherous. Rendering the invention fit for customer use includes manufacturing, demonstrating that the invention is reasonably safe to use and also acquiring the numerous, regulatory permissions now required by the modern welfare state.³⁷ Each milestone along the way produces ideas, data, recipes, formulas and results that are difficult to keep out of the reach of poachers and other free riders.³⁸

Demsetz explained why the financing of commercially valuable information would not be a problem in a world without transaction costs. In such an imaginary world, the costless negotiation and enforcement of contracts would make it possible for investors to enter into contracts with would-be free riders. Each free-rider, lacking the incentive to misrepresent his (subjective) offer price would immediately volunteer to pay his fair share of the (discounted expected value) of these investments in knowledge production.³⁹ But the private transaction costs of preventing the uncompensated diffusion of business information is quite substantial as Kenneth Arrow realized in 1962.⁴⁰

Arrow's celebrated statement of the problem immediately became the standard textbook rationale for declaring that government intervention is needed to support inventive effort. Arrow insisted that the system of perfect competition invariably leads to a nonoptimal allocation of resources. By encouraging the rapid and speedy diffusion of commercially valuable information, potential investors can avoid committing resources in these areas since anything they produce of value is quickly exploited by nonpaying free-riders.

Arrow acknowledged that the patent system, by creating property rights in "inventions," does help restore business incentives in the later stages of technological innovation, but what about the early stages?⁴¹ Arrow suggested that it is the incompleteness of property rights that creates the allocative inefficiency:

. . . if the seller can retain property rights in the use of the information, this would be no problem, but given incomplete appropriability, the potential buyer will base his decision to purchase information on less than optimal criteria.⁴²

Arrow concluded that "for optimal allocation to invention it would be necessary for the government or some other agency not governed by profit-and-loss criteria to finance research and invention."⁴³

There is no doubt that Arrow simply leapt from the litany of insightful statements about the

difficulties of appropriating the value of commercially valuable information, under competitive conditions, to the amazing policy conclusion that a government subsidy program is required. Arrow's conclusion is, at best, a leap of faith or, perhaps, an expression of lack of faith in market alternatives to government intervention. In 1969, Demsetz questioned the logical coherence of Arrow's policy analysis.⁴⁴

Demsetz appealed to economists to avoid the "nirvana approach." What was the point of comparing the current, actual, everyday world of business practice to some fanciful, ideal world of costless exchange and then concluding that the real world of commercial life is "defective." Possibly the only rationale for such an approach is a cynical one; namely, just about any form of government intervention can be shown to be superior to existing business practice. Arrow is, perhaps, unwittingly lending his support to those who use the abstract model of perfect competition as a foil to justify the continued funding of large-scale, government intervention in commercial life.

Demsetz called for the immediate adoption of the "comparative institution approach."⁴⁵ Economists should judge existing market institutions but only after considering what alternative institutions would emerge in their absence. The comparison is not between existing, commercial practice and some ideal, unobtainable, abstract world of perfect competition but, rather, between existing commercial practice and what would otherwise arise if we limited existing practice by legal rules and sanctions according to certain practical, administrative criteria. Such a comparison might, on occasion, strengthen the case for a government intervention and on other occasions weaken it. Consider, for example, Steven Cheung's defense of the creation of property rights in inventions by a patent office.⁴⁶

In an article published in *Economic Inquiry* in 1982, Cheung summarized several well-known arguments against the patent system, as follows:

... it has been argued that an idea is a "public" good, amenable to concurrent usages, and for that reason any patent protection which allows a fee to be charged for its use will "inefficiently" inhibit its usefulness and diffusion. Other arguments are that patents create monopoly rights, encourage wasteful duplication of research effort, or promote a rush to invent. By similar reasoning, a popular thesis asserts that patent protection leads to the dissipation of economic rents.⁴⁷

Cheung reminded us, however, that the abolition of the patent system will not bring on the regime of perfect competition. Without a patent system, not all inventions will be speedily expedited. Instead, the abolition of patenting will induce certain investors to rely more heavily on the law of trade secrecy to protect their inventions.⁴⁸

The creation and maintenance of secrecy depends on establishing carefully defined relationships between employers and employees usually enhanced by way of explicitly drafted, nondisclosure, private contracts. These contracts are explicitly designed to *limit* the mobility of the laborer by prohibiting the sorts of jobs he or she can accept should the present job situation not last. These contracts depend on the availability of swift and (relatively) inexpensive, judicial enforcement; otherwise they will not be effective. It was clear that Cheung took it for granted that, in the absence of the patent system, such agreements would be enforced by the courts.⁴⁹ Based on this, he concluded that a regime of nondisclosure and the widespread duplication of investment in commercially valuable information would come into existence if the patent system were to be abolished. Such a surge in trade secrecy would result in an allocation of inventive effort far inferior to what we now have with the patent system, itself.⁵⁰

Cheung opted for the patent system over trade secrecy. The system of patent examination and the issuing of limited, exclusive rights to inventions is nearly always superior to the sort of hoarding of information that would be set in motion should the patent system ever be abolished. In Cheung's words:

... if the patent system were to be eliminated, the "undesirable" effects attributed to it would emerge elsewhere in aggravated form. In other words, economists, [that is, economists following Pigou or, perhaps, Arrow] tend to overlook the crucial question: What would an inventor or innovator do if there were not patent protection?⁵¹

Cheung's article is an interesting and convincing extension of the Coase-Demsetz property-rights

approach to policy problems. It is based on the critical assumption that, in the absence of the patent system, the courts would be willing to enforce privately negotiated employee-employer covenants not-to-compete and related non-disclosure agreements. How sympathetic are the courts to enforcing such contracts? If judges were unwilling to enforce trade secrecy agreements because they seem violative of basic rights to move from one job to another, what alternative market institutions might emerge to facilitate trade.⁵² The answer to these questions can be answered by carefully considering the human capital approach in economics.

Becker and the Chicago Human Capital Approach

At first glance, the human capital approach, which became a distinctive research program at the Chicago economics department during the 1960s, seems to owe little to the line of research underway at the Chicago Law School. Instead, the analysis of human capital and the market institutions leading to its production maintenance and diffusion seems to be an insular development entirely *within* Chicago's economics department, although drawing inspiration and doctrinal support from a long list of writers dating back several centuries.⁵³ It is true that Chicago economist Frank H. Knight's repeated emphasis on treating factors of production as essentially alike and subject to improvement through investment may have been the immediate catalyst for the development of the human capital approach among the Chicago faculty.⁵⁴ Quite obviously, individuals do invest resources in improving their own job market skills by going to college and obtaining professional degrees and then qualifying for licenses. But, despite this and other, often-cited "anticipations" of the human capital approach, in 1961 it was Chicago economist, T.W. Schultz, that sounded the call.⁵⁵

Schultz argued that there were important market phenomena that simply could not be adequately explained without a more carefully crafted concept of human capital. As Schultz remarked, "the most distinctive feature of our economic system is the growth in human capital."⁵⁶

It remained for Gary Becker to extend the ongoing, actual research program on the problem of the production and maintenance of human capital to the workplace situation and the contract between employer and employee.⁵⁷ Becker's great contribution was to recognize that on-the-job training was as important, if not more important, to the evolution of commercial institutions than formal, professional schooling.

The economic problem was to explain how this training was financed in a world where the courts are hostile to agreements that restrict mobility of labor. Stated quite simply, why should Ajax Industries, Inc. train a manager about how to use new techniques in, say, glassmaking if, after acquiring these skills and knowledge, the manager could quit his job and go work for a competitor firm at a higher wage? Becker's answer was entirely consistent with the competitive model of labor market equilibrium. The (marginal) employers and (marginal) employees are reasonably informed about what this knowledge and skill will mean in terms of their future income. The employees therefore agree to work for less than the market value of their marginal product, and in exchange for such "bargain wages," the employers implicitly agree to finance this on-the-job training. What we have, in fact, is an implicit contract in which employees are paid a "discounted," marginal product discounted by the cost to the employer of the on-the-job training that is supplied.⁵⁸

Consider still one more example: Suppose company A was established by a scientist-entrepreneur who had discovered a new formula for a delicious soft drink. Assume, further, that the process cannot be reverse engineered in the usual manner from a sample of the final product purchased on the open market.⁵⁹ As this entrepreneur begins to scale-up for wide, regional, market sales, he might find it necessary to share that formula with other employees. In order to insure his market power at the time he hires these employees, he negotiates so-called trade secrecy agreements and various covenants not to compete. The employees now acquire on-the-job training that will not be easily transferable to a competitor firm. In exchange for this evident decrease in their job mobility, they must be paid a premium wage.⁶⁰

There are definite advantages to paying premium wages. High wages cut down on employee

turnover and help encourage a more enthusiastic and cooperative workforce.⁶¹ On the other hand, paying employees a wage in excess of the marginal productivity also serves to reduce the returns from the new invention that would otherwise be available to the investor/entrepreneur. "Golden-handcuffs" are effective and legal, but they may be too expensive to use because any single employee or small group of employees can strategically "hold out" for a remuneration package that will appropriate most of the rents that might, under a patent system, accrue to the original investor-scientist.⁶²

Curiously, Becker's distinction between information described as "basic research" and the information described as "on-the-job training" goes directly to the heart of the matter. On-the-job training can be "financed" through a competitively determined wage rate that is somewhat less than a worker's current, opportunity wage. This is because the workers are not slaves and, therefore, a worker's skills cannot be used without a worker's willing participation and consent. Thus, the production of this sort of knowledge results mostly in "internalities" and not in the troublesome "externalities" that concerned Coase and Demsetz.⁶³

Basic research, *unlike on-the-job training*, can be copied and used without the participation of the person or persons originally possessing it. Creations of this sort produce externalities that cannot easily be internalized, and so it is basic research that may need public subsidies and not on-the-job training. Becker explained:

The difference between investment in training and in research and development can be put very simply. Without patents or secrecy, firms in competitive industries may have difficulty establishing property rights in innovations and these innovations may become fair game for all comers. Patent systems try to establish these rights so that incentives can be provided to invest in research. Property rights in skills on the other hand are automatically vested, for a skill cannot be used without permission of the person possessing it. The property right of a worker in his skills is the source of his incentive to invest in training by accepting a reduced wage during the training period and explains why an analogy with unowned innovations is misleading.⁶⁴

Becker suggested (anticipating Cheung's position) that, if the patent system were abolished, business secrecy would become much more important.

Kitch and Organizational Design

In a 1980 article entitled "The Law and Economics of Rights in Valuable Information," Edmund Kitch argued that the courts are extremely reluctant to enforce contracts in which employers try to prevent former employees from taking jobs with competitors as a way of protecting investments in intellectual property.⁶⁵ Judicial attitudes on these matters date back to at least the 18th century when the Settlement Act and common law apprentice practices came under attack from Adam Smith and other members of the classical liberal school.⁶⁶ In the 19th and 20th centuries, these attitudes were reinforced by the revolt against slavery. Contracts that intend to restrict the mobility of labor must be reasonable, or else they will be declared void as a matter of public policy.⁶⁷

Kitch hypothesized that, in this legal climate, it would be far cheaper and more reliable if employers could divide and subdivide the knowledge within the firm so that no single employee has enough of it to "hold up" the owners of the business for higher wages or benefits.⁶⁸ To appreciate Kitch's point, consider the following parable: Suppose a firm has a strongbox filled with jewels which is fastened down but left unattended in a public area. In order to prevent the theft of the jewels, the owners of the firm do not entrust the combination lock sequence to any one, single individual. Instead, several individuals each memorize one digit, and still another individual has a list showing the sequence in which each of the aforementioned individuals should go to the lock and register his number.

If these several individuals were kept from communicating with each other by, say, separating them in the large firm, even staggering their lunch hours, then the departure of any one individual, or even several, will not lead to a looting of the firm's precious jewels. A large, vertically integrated firm can be thought of as an ingenious, organizational innovation designed to keep the company jewels from leaving the organization and becoming public information. Each department within the firm has a bit or piece of

the final combination, but no one individual or department and certainly no small group of employees can easily make off together with the entire company jewels.⁶⁹

The knowledge has become, so to speak, "institutionalized" within the firm, and in this way, unless the firm is acquired outright by a takeover or such, the basic research is largely protected from copying by others. Certainly, in the absence of a patent system, we might expect trade secrecy to become more prevalent in business. But if the courts were reluctant to enforce employer-employee agreements, as Kitch maintains, then the large, vertically integrated firm might, by itself, become the least costly way of helping the creators of intellectual property produce and maintain the fruits of their intellectual harvests.

If commercially valuable information were carefully folded into the various departments and operating procedures of the business organization and not centralized in any single location, then the likelihood of its becoming rapidly diffused among free riders is significantly lessened. The practical effect of such a structure is an increase on the return on intellectual property and, by implication, the encouragement of its continued production.

The existence of the large, hierarchical corporation and the tight-lipped "corporation man" may, indeed, be one spontaneously evolved market response to the enigma of intellectual property. Another response was analyzed by Feinstein and Stein (F&S) in 1988.⁷⁰

F&S coined the phrase, "internal redundancy," by which they meant the "practice of assigning employees to partially overlapping tasks."⁷¹ This apparent duplication of effort is not irrational when viewed in its proper context. If the firm were concerned that project managers may leave and take the projects with them, then "redundancy" may be a cost-effective method of deterring the untimely diffusion of intellectual property. In the words of F&S, "A researcher will be less tempted to strike out on his own if there is a chance that the project he is working on or the skills he has acquired will be duplicated by someone else."⁷² The authors place their work in a line of descent from Coase's 1937 article on the analysis of the firm.⁷³ My intention here is to show that these authors pursue a line of argument that may be properly housed in the broader Chicago intellectual property rights tradition. What is studied are the noninterventionist alternatives to so-called "market failures." F&S, along with Kitch, demonstrate the rich insights provided by this approach.

In my view, the research program is a viable one and, at this writing, remains in its early stages of development.

RECONCILIATION OF COASE AND HAYEK

Creation and Retarded Diffusion of Intellectual Property

Knowledge about the Chicago intellectual property rights tradition can help us reconcile two important views of the market system that have always seemed to defy reconciliation. On the one hand there is Friedrich A. Hayek's classic 1945 paper on "The Use of Knowledge in Society," which presents the case for the pricing system in terms of how it encourages an efficient utilization of the *available* information in society.⁷⁴ The knowledge is utilized, not by first becoming centralized in bureaus and then published in encyclopedias and the like, but, rather, by creating private (financial) incentives for individuals to acquire fragmented bits and pieces of that knowledge and then utilize that knowledge most effectively for their own personal advantage. The result is a complicated and coordinated production structure that accomplishes much more than any single, individual actor could ever have imagined. If the economic problem were, as Hayek supposes, one of utilizing information that is already in the world, then the pricing system has everything to recommend it, and Hayek's view is correct. All transactions should be conducted by way of arm's-length, bargained-for contracts, and prices are formed for well-defined products and services.

Why, then, do we observe business firms? A business firm is, in a profound sense, a substitute mechanism for the pricing mechanism. This was the thesis of an article by Ronald Coase published in 1937 and entitled "The Nature of the Firm."⁷⁵ According to Coase, a firm is established to avoid certain

costs identified with the pricing system. These costs must surely include those of transacting business through written contracts between otherwise, unrelated individuals. As Coase and subsequent writers explained, these costs are diminished when hierarchical relationships are substituted for contract.⁷⁶ These hierarchical relationships between employers and employees constitute the business firm. However, there are also costs that arise when the pricing mechanism is limited and individuals are brought together in business organizations. The outside check of market competition is done away with, and the employer must rely more heavily on the loyalty, dedication and honesty of his employees.⁷⁷ According to Coase, the optimal size of the organization is obtained when:

... at the margin, the costs of organizing within the firm will be equal either to the costs of organizing in another firm or to the costs involved in leaving the transaction to be "organized" by the price mechanism.⁷⁸

The same line of thinking is carried over in Kitch's recent work. According to Kitch:

There is an optimal number of markets in an industry. Too few markets will raise the internal information cost problems for firms, too many markets will erode the net value of the information they generate.⁷⁹

It is very difficult to profitably arrange for both the production and maintenance of intellectual property by relying exclusively on the price system, especially under the labor market conditions in which courts frown on restrictive agreements between employers and employees, except under the most egregious circumstances. The reluctance of the courts make trade secrecy a rather unreliable method for appropriating the returns on investment in intellectual property.⁸⁰ The price system, which is extremely effective at utilizing information that is *already* in existence would bankrupt those who create intellectual property if allowed to operate unimpeded. A Hayekian price mechanism that facilitates the duplication and diffusion of already created information results in too few resources being devoted to the production and maintenance of intellectual property in the first place.

Potential information producers do have at least one other alternative. They can utilize the new information to their personal advantage by establishing a business firm. A Coasean world dominated by firms that have been established to economize on certain costs associated with the use of the price mechanism can also be a world able to account for investments in the production and maintenance of intellectual property. The vertically integrated firm is a burden on economic life when we ask, for the present moment, how information *already in the world* can be most advantageously utilized.⁸¹ The integrated firm becomes valuable to modern, economic life when we ask how individuals can be encouraged to bring commercially valuable information into the world in the first place. The Chicago law tradition, with its emphasis on comparative institution analysis, has furnished us with a coherent and unconventional understanding of market institutions.

Conclusion

The Chicago intellectual property rights tradition offers a rich and suggestive interpretation of market institutions as alternatives to direct government tax and subsidy schemes. By making particular legal and other institutions a serious subject for investigation, Chicago economists have enriched our understanding of the diversity of the market process. They have also pointed the way toward a more realistic appraisal of the role of government in the economy. I have tried to show how this approach now encourages a viable research program and, in addition, can be used to reconcile Coase (1937) and Hayek (1945).

NOTES

1. An early version of this paper was presented to a joint session of the History of Economics Society and the American Economic Association on "The Chicago School." My thanks to the Babson Board of Research for a course release in the Spring of 1990 and Professors Ingrid Rima, Richard Gonce and Warren Samuels for their thoughtful criticisms. The usual disclaimers apply.

2. See R.H. Coase, "The Problem of Social Cost," *Journal of Law and Economics*, 3(October 1960):1-44; in idem., *The Firm the Market and the Law*, (Chicago: University of Chicago, 1988), pp. 95-156.
3. The "cross-fertilization" claim is supported by strong testimonial evidence, see E.W. Kitch, "The Fire of Truth: A Remembrance of Law and Economics at Chicago, 1932-1970," *Journal of Law and Economics*, 26(April 1983):163-232; especially G. Becker's recollections, p. 185.
4. Many law schools offer specialized courses in intellectual property. A typical list of subjects includes patent systems, copyright laws, trade secrets, trademarks and so on. For a leading case book on these topics, see P. Goldstein, *Copyright, Patent, Trademark and Related State Doctrines*, 2d. ed. (Mineola, New York: Foundation Press, 1981).
5. Kitch, "The Fire of Truth," pp. 179-182.
6. The relevant writings are, Harold Demsetz, "Information and Efficiency: Another Viewpoint," *Journal of Law and Economics* (March 1969) in idem., *Efficiency, Competition and Policy: The Organization of Economic Activity*, 2 vols. (Blackwell, 1982)2:3-24; and S.N.S. Cheung, "Property Rights in Trade Secrets," *Economic Inquiry*, 20(January 1982):40-43.
7. Cf. Coase, "The Problem of Social Cost," in *The Firm*, p. 153-156.
8. E.W. Kitch, "The Law and Economics of Rights in Valuable Information," *Journal of Legal Studies* (December 1980):683-723.
9. R.H. Coase, "The Nature of the Firm," *Economica*, 4(November 1937); in idem., *The Firm*, pp. 33-55.
10. F.A. Hayek's "On the Use of Knowledge in Society," *American Economic Review*, 35(September 1945):519-30. I find it curious that Hayek, himself, was not engaged by Coase's conceptual challenge. At other places, Hayek treated the firm as consisting of a collection of investment projects and limited in its ability to borrow loanable funds; see L.S. Moss and K. Vaughn, "Hayek's Ricardo Effect: A Second Look," *History of Political Economy*, 18(Winter 1986):545:565.
11. Kitch, "The Fire of Truth," pp. 163-232.
12. Ibid.
13. Kitch, ed., "The Fire of Truth," pp. 175-177; cf. H. Simons, *Economic Policy for a Free Society* (Chicago: University of Chicago Press, 1948).
14. Ibid.
15. Ibid.
16. Ibid., see also R.H. Bork, *The Antitrust Paradox: A Policy at War with Itself* (New York: Basic Books, 1978), pp. 1-11.
17. Ibid.
18. Bork recommends that the "only goal" of the antitrust laws should be the welfare of consumers. To the extent that business investment is directed to satisfying the most urgent demands of consumers as translated through market prices, the maximization of wealth and consumer welfare are compatible. See Bork, *The Antitrust Paradox*, p. 405.
19. Kitch, "The Fire of Truth," p. 201.
20. Ibid., p. 203.
21. Ibid., pp. 207-208.
22. J.S. McGee, "Predatory Price Cutting: The Standard Oil (N.J.) Case," *Journal of Law and Economics*, 1(1958); K. Elzinga, "Predatory Pricing: The Case of the Gunpowder Trust," *Journal of Law and Economics*, 13(1970); W.S. Bowman, *Patent and Antitrust Law* (Chicago, 1973).
23. Coase stated, "... When I came to the University of Chicago, I regarded my role as that of Saint Paul to Aaron Director's Christ. ... He got the doctrine going, and what I had to do was bring it to the gentiles. And I don't think I would have ever come to the University of Chicago had it not been for the existence of the *Journal of Law and Economics* ..." in Kitch, ed., "The Fire of Truth," p. 192.
24. Ibid., pp. 220-222.
25. A.C. Pigou, *The Economics of Welfare* (London: Macmillan, 1950).
26. Nearly every modern economics text contains a section on "taxing-the-harm." For Coase's critique, see his "Problem of Social Cost" in idem, *The Firm*, pp. 133-153.
27. Ibid.
28. It is customary to speak of "bribing" Mrs. O'Leary; however, this language makes a mockery of the judicial decision since, quite obviously, judges do not exist to promote bribery or its equivalent.
29. Coase, "The Problem of Social Cost," in idem, *The Firm*, pp. 119-133.
30. Ibid., pp. 133-156.
31. Ibid., p. 150.
32. Ibid., p. 154.
33. Kitch, "The Fire of Truth," p. 191.
34. H. Demsetz, "Toward a Theory of Property Rights," *American Economic Review* (May 1967), in idem, *Ownership Control and the Firm: The Organization of Economic Activity*, 2 vols. (Blackwell, 1988), p. 105.
35. Ibid.
36. P.F. Drucker, *Innovation and Entrepreneurship: Practice and Principles* (Harper and Row, 1985), pp. 137-138.

37. Cf. P. Asch, *Consumer Safety Regulation Putting a Price on Life and Limb*, (Oxford: 1988).
38. R.M. Milgrim, ed., *Protecting and Profiting from Trade Secrets 1979* (Practicing Law Institute, 1979).
39. Demsetz, "Information and Efficiency," in idem, *Efficiency*, pp. 12-13.
40. K.J. Arrow, "Economic Welfare and the Allocation of Resources for Invention," in idem, *Essays in the Theory of Risk-Bearing* (Chicago: Markham, 1971), pp. 144-165.
41. Ibid., p. 154.
42. Ibid., p. 152.
43. Ibid., p. 160.
44. Demsetz, "Information and Efficiency," in idem, *Efficiency*, pp. 3-24.
45. Ibid., p. 3.
46. S.N.S. Cheung, "Property Rights in Trade Secrets," *Economic Inquiry*, 20(January 1982):40-53.
47. Ibid., p. 40.
48. Ibid.
49. Ibid., p. 43.
50. Ibid., pp. 44-45.
51. Ibid., p. 40.
52. At one place, Cheung refers to "labor laws [that] restrain the right to contract between employers and employees," but concludes that these laws only make employment contracts more costly to enforce; *ibid.*, p. 47.
53. See B.F. Kiker, "The Historical Roots of the Concept of Human Capital," *Journal of Political Economy*, 74(October 1966); and J.R. Walsh, "Capital Concept Applied to Man," *Quarterly Journal of Economics*, 49(1935):255-285.
54. F.H. Knight, *Risk, Uncertainty, and Profit*, London School of Economics and Political Science Reprint (Boston, 1933), p. 159.
55. T.W. Schultz, "Investment in Human Capital," *American Economic Review*, 51(March 1961):1-17.
56. Ibid., p. 16.
57. G. Becker, *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education* (New York, 1964).
58. Ibid., p. 8-29.
59. Suppose the secret is the specific sequence of mixing including temperatures and speed of mixing. In this case, there is no easy way to reverse engineer a process based on an examination of the final product. Cf. W. Casey and L. Moss, Intellectual Property Rights and Biotechnology," *Idea*, 27(1987):251-268.
60. Becker, *Human Capital*, pp. 20-21.
61. This was one of the principal reasons Henry Ford gave for departing from industry standards and instituting what he called the "five dollar a day minimum wage" in the automobile industry.
62. Kitch, "The Law and Economics. . . . p. 708.
63. Becker, *Human Capital*, p. 18.
64. Ibid.
65. Kitch, "The Law and Economics," p. 705.
66. A. Smith, *A Wealth of Nations*, 2 vols (Oxford, ed., 1976), I:138.
67. D.J. Aspelund and C.E. Eriksen, *Employee Noncompetition Law* (New York: Clark Boardman, 1989); see especially ch. 2 and 3.
68. Kitch, "The Law and Economics," p. 705; cf. W.L. Casey, J.E. Marthinsen and L.S. Moss, "Trade Secrecy and Patenting: Complementary or Substitutable Activities?" (Unpublished MS), Babson College (October, 1978).
69. Ibid.
70. J.S. Feinstein and J. Stein, "Employee Opportunism and Redundancy in Firms," *Journal of Economic Behavior and Organization*, 10(1988):401-414.
71. Ibid., p. 402.
72. Ibid.
73. Ibid., pp. 402-403. F&S name O.E. Williamson, *Markets and Hierarchies* (Free Press, 1975) an immediate predecessor of this approach. Williamson emphasized the opportunism that exists within the firm but stated that vertical integration is a rational response trying to conduct business in a low-trust culture. See O.E. Williamson, "The Vertical Integration of Production: Market Failure Considerations," in idem, *Economic Organization: Firms, Markets and Policy Control* (New York: 1986), p. 98.
74. Hayek, "The Use of Knowledge."
75. Coase, "The Nature of the Firm," in idem, *The Firm*, pp. 33-55.
76. Ibid., cf. A. Alchian and H. Demsetz, "Production, Information Costs, and Economic Organization," *American Economic Review*, 62(1972); in Demsetz, *Ownership Control and the Firm*, (Blackwell, 1988), pp. 119-143.
77. O.E. Williamson, *Markets and Hierarchies* (Free Press, 1975).
78. Coase, "The Nature of the Firm," in idem, *The Firm*, p. 55.
79. Kitch, "The Law and Economics," p. 720.
80. Ibid.
81. Hayek, "The Use of Knowledge."