THE LAW AND ECONOMICS OF RIGHTS IN VALUABLE INFORMATION

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This essay describes and analyzes the welfare consequences of the law governing the ownership of information by firms and their employees and the transmission of information from one firm to another. Because I have elsewhere discussed the welfare consequences of the patent system,1 the focus here is on the many kinds of information required for the efficient operation of enterprises other than new technology. The essay is intended to draw the attention of economists to the importance of the institutional arrangements other than patents that shape the production and dissemination of industrial information.

The first section describes the legal rules and discusses the arguments traditionally offered for them. The ideas used to organize this description are drawn from the modern literature on human capital and theory of the firm. The section argues that in spite of the law’s development under such diverse headings as trade secrecy, covenants not to compete, corporate opportunity, fraud and restitution, there is a coherent functional pattern to the common law rules. This pattern has, however, been altered by the federal securities and freedom of information acts. The second section deals with the welfare consequences of the law described. Although a definitive welfare analysis of the rules is not offered, welfare arguments for the common law rules are developed. A principal contribution of this section is to relate recent developments in price theory and finance to these problems. The section also speculates on the implications of the institutional structure of information generation and transmission for some basic issues in industrial organization and monetary theory.

I. THE LAW

Anglo-American law governing the subject may be divided into two sections: information embodied in human capital and information embodied in

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firms. Both workers and firms are carriers of information, and the legal issues have centered on the relationship between them.

A. Information Embodied in Human Capital

The human capital of a worker includes the information he has. The following two paragraphs briefly summarize Becker's pioneering analysis.2

General human capital is capital of value to many firms, and a worker is in a position to capture its value at any of those firms.3 He will, therefore, pay the costs of acquiring this capital, either through payments (tuition) or reduction in salary. A firm providing training that adds to general human capital can arrange its payment schedule so that at any given time it has provided the worker with the amount of training for which he has paid. Thus the free movement of workers need not be restrained to generate incentives for training that provides general human capital.

Specific human capital is human capital with value only to a particular firm.4 In the information context, an example is knowledge of the firm's operating procedures and personnel. Because this information is of value only to the firm, the firm will pay for the necessary training, and an employee cannot steal the information for use elsewhere. There is thus no need to restrain the free movement of workers to generate incentives for training that provides specific human capital.

Since at least 1800, Anglo-American law has provided no protection to a firm for the value of the human capital of its employees. Employees have been free to change employment at will. This law displaced an earlier legal regime, centered on the Statute of Laborers of 1492, which significantly restricted the free movement of labor.5

More interesting, and more difficult to analyze, is the severe limitation in this modern law on types of contractual arrangements that can be used to restrict the movement of employees.6 The issue has been litigated most frequently in the context of postemployment covenants not to compete. These covenants are written agreements providing that in the event of termination of employment the employee cannot work for a competitor for a

3 Id. at 19-26.
4 Id. at 26-37.
6 While this essay was in preparation Paul H. Rubin & Peter Shedd were writing Human Capital and Covenants Not to Compete, 10 J. Legal Stud. (forthcoming 1981). We share a common dissatisfaction with the traditional explanations for judicial reaction to covenants not to compete. Rubin and Shedd explain invalidation of such contracts on grounds of opportunistic behavior. This argument is discussed in note 95 infra.
specified length of time in a specified area. The courts have applied strict standards of reasonableness to these contracts and have upheld them only in the case of employees who possess secret technical information or who have customer contact responsibility. A common example of the latter type of case is a route or delivery man who, as the sole contact between the firm and its customers, is in a position to take the customers with him to a new firm—sometimes without the customers even being aware of it. The courts have required that the restraint be reasonable in time and scope in relation to the protectible interest of the employer. A sales employee, therefore, can only be restrained from working for a competitor in the same area that he has worked for the firm. The courts have until recently applied this rule in a particularly harsh way, holding that if they determine, after the fact, that the restraint is unreasonable, the restraint will be void, not simply cut back (or "blue penciled") into a reasonable one.

It is difficult to explain why the courts have been so hostile to these contracts. There are economic reasons why such contracts could be desirable. In the case of general human capital, an employee may be unable to finance training that enhances his capital unless he is able to borrow against the promise of his future services. The employer would loan the employee funds during the training period by paying him wages above his marginal productivity and collect the loan in a later period by paying wages under marginal productivity. But if the employee is free to leave at anytime, he will be attracted to other employers by wages equal to his marginal productivity during the "pay-back" period, and the employer will have no incentive to make the loan. In the case of specific human capital, training costs will be reduced if the employer can use contractual devices that reduce turnover. This problem can be partly resolved by timing the compensation stream so that the employee always has an incentive to stay. But again it is not clear why arrangements that restrict the employee's options are not among the range of permissible contractual solutions.

Harlan Blake, whose article "Employee Agreements Not to Compete"10 is the most authoritative exposition of the Anglo-American law on this point, sees the question for the courts in each case as one of balancing the interests of the employer as against the interests of the employee. The reasons such covenants should not always be enforced are:

7 Contemporary distribution methods have made these cases something of an anachronism. The hold of a routeman on his customers is suggested by Olschewski v. Hudson, 262 Pac. 43 (Cal. Ct. App. 1927), where the receiver for a bankrupt laundry complained that his efforts to sell a route had been foiled by the routeman's having sold it.

8 Harlan M. Blake, Employee Agreements Not to Compete, 73 Harv. L. Rev. 625, 681-84 (1960).

9 Becker, supra note 2, at 29-30.

10 Blake, supra note 8.
"that postemployment restraints reduce both the economic mobility of employees and their personal freedom to follow their own interests. These restraints also diminish competition by intimidating potential competitors and by slowing down the dissemination of ideas, processes, and methods. They unfairly weaken the individual employee's bargaining position vis-à-vis his employer and, from the social point of view, clog the market's channeling of manpower to employments in which its productivity is greatest."\(^{11}\)

The central issue is not the desirability of such contractual arrangements in particular cases but why employer and employee are not free to enter into arrangements that they consider desirable in light of the circumstances. Why doesn't the usual assumption that contracting parties can protect their own interests control here as elsewhere? There are two basic answers in the legal tradition, accurately summarized by Blake's statement. First, employees lack the capacity to contract in this way. And, second, such contracts impair competition.

1. Lack of Capacity

This explanation is not entirely consistent with the approach of the courts, since the courts uphold the enforceability of such covenants in the area of customer contact and trade secrecy. This inconsistency is not to be explained on the ground that such employees are high level executives with the background and sophistication necessary to appreciate the significance of a restrictive covenant that impairs employment options for a long time. A low level employee who falls within the trade secret or customer contact exceptions is held to the terms of a reasonable restrictive covenant. A laboratory technician or routeman can be bound not to engage in competitive activities. Conversely, a highly paid and sophisticated management employee not involved in sales and not in possession of trade secrets cannot be effectively bound by any covenant.

The view is sometimes expressed that if such clauses were generally permitted they would be routinely exacted from employees.\(^{12}\) This view assumes either that such clauses are usually in the interest of the employer or that employees would not value, and hence not charge for, the right to future freedom of choice. Such clauses are not in the interest of an employer unless he makes significant investments in the employee's human capital. If the employee offers general skills that can be provided by others on the labor

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\(^{11}\) Id. at 627.

\(^{12}\) Id. at 650. "It [a postemployment restraint] is particularly distasteful if there is no effective bargaining between the parties—as in the situation in which the employer knows that everyone else in the industry insists on the covenant too, or when the employment officers have no authority to change the provisions of the employment contract form."
market, the employer is indifferent to who provides those skills since he will have to pay the market wage in any case.

The complexity and difficulty of a restrictive covenant do not seem to exceed other issues on which employers are permitted to bargain freely. For instance, fringe benefits or pension plans involve judgments about future events and needs of the employee. The congressional pension reforms imposed by the Employee Retirement Income Security Act suggest the modern consumerist response to problems of this type—mandated disclosure, standardized contractual arrangements, and special formation procedures. The Truth in Lending Act imposes similar requirements on lending arrangements, which often have term features well in excess of the likely relevant term of covenants not to compete. These responses, however, have not included outright prohibition of the form of contract.

One easy explanation why the lack of capacity argument has such appeal is the judicial rule restricting the contract form. The courts have refused to enforce the contract, so the contract is seldom used. Because it is seldom used, society has no stock of "received wisdom" about the advantages and disadvantages of such contracts. If the rule were suddenly changed, employers and employees would have to learn about such contracts and during the learning process there would be more mistakes than with other well-established contract forms. In this view, the rule creates the conditions of its own social desirability. Blake has persuasively shown that the rule's origins lie not in the contractarian structure of the nineteenth-century common law but in the older status law of master and apprentice.\footnote{Id. at 629-37.}

The early cases involved apprentices whose masters had made them promise not to pursue their craft, as masters, after the end of the fixed term of apprenticeship. The courts held that the status of master was inconsistent with such contractual restraints. The nineteenth-century cases analogized the position of the newly contractually autonomous worker to that of a master and held that the precedents forbade such agreements. The rule, once adopted, became its own justification.

It is difficult to put much weight on the capacity argument in light of three anomalous regimes of employment: entertainment,\footnote{Courts have been willing to uphold exclusive contracts in the entertainment industry because of the unique nature of the services involved and to issue injunctions against competitive employment to enforce them. These injunctions date back to Lumly v. Wagner, 1 DeG., M. & G. 604, 42 Eng. Rep. 687 (Ch. 1852); Materials on modern practice are to be found in Russell J. Frackman, The Failure to Pay Wages and Termination of Entertainment Contracts in California, 52 S. Calif. L. Rev. 333 (1979); and Note, id. at 489.} professional sports,\footnote{These special employment institutions are summarized in Lionel S. Sobel, Professional Sports and the Law 83-243 (1977).}
and military enlistment. In these cases, entering workers sign contracts that restrict their employment options for significant periods of time. The young ballplayer or military volunteer seems to be able to understand the implications of such contracts and bargain for offsetting terms. Not surprisingly, these special regimes are justified on the basis of the need for the employer to invest in specialized training for the employee.

2. Reduction of competition

This argument is a form of the frequently encountered fallacy of confusing spot markets with competition and considering long-term contracts a form of monopoly. The question is not whether there will be competition among employers for labor and vice versa, but whether that competition will take the form of a spot market for hours of labor or the form of a single contract for many services. A specific form of the fallacy is Blake's argument above that contracts which restrict the right to change employment will prevent labor from moving to its highest valued use. This is not the case, since the parties to the transaction can always retransact. If an employee has a higher valued activity in some other employment, he can offer a payment to his employer to obtain release from his contract, as is done in professional sports.

It is usually assumed that such contracts have a significant impact on competition because the employees of the firm possess knowledge or skill not possessed by others. If these employees were indistinguishable from other employees in general, their presence or absence as potential entrants would make no difference. But if the employees do have special skills or information, what matters is how they acquired it. If they acquired it as the result of investments by the firm, then their departure is a loss to the firm on that investment. The question is not whether there will be competition but whether such contracts would serve a useful purpose in permitting firms to capture the returns from investments in human capital and, thus, create the appropriate incentives to make such investments.

B. Information Embodied in Firms

Firms also possess information. This is easy to see in the case of a trade secret written on a piece of paper locked in the firm's safe or existing as part of the human capital of the employees who know the secret. It is less easy to see when information exists only in the form of the memories and habits of employees. Assume, for instance, that six employees of a firm know a par-

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16 The law is summarized in David A. Schlueter, The Enlistment Contract: A Uniform Approach, 77 Mil. L. Rev. 1 (1977). The cases of validity of the contract have focused on parents trying to undo the enlistments of their minor children.
ticular piece of information. If the employees are paid a competitive wage so
that they are unlikely to leave, and if they are effectively constrained from
communicating the information to others, then the firm has an asset apart
from the human capital of the employees. Firms carry information in a web
of contractual relations and property rights.

Information held by firms, unlike information embodied in human capital,
is not self-appropriating. Becker recognizes this feature explicitly for techno-
logical innovations,17 but it is true of all information that can exist apart
from human capital. For instance, a firm that has prepared a competitive bid
can lose the value of the preparatory material if the bid is communicated to a
competitor who bids one dollar less. Similarly, a firm that loses a training
manual to a competitor suffers a reduction in value.

The law has given special protection to a class of information called trade
secrets. This section will discuss, first, the law of trade secrets and then the
law protecting other kinds of information.

1. Trade Secrets

The courts protect trade secrets with both damage and injunctive reme-
dies. The first English cases, involving formulas for medicines, date from the
second decade of the nineteenth century, and the first American cases, in-
volving manufacturing processes, from the middle of the century.18 "A trade
secret," says the Restatement, "may consist of any formula, pattern, device
or compilation of information which is used in one's business, and which
gives him an opportunity to obtain an advantage over competitors who do
not know or use it."19

The question of whether information should be protected is decided by the
courts. They require that the information have value, be used in the firm,
and not be generally known by others. Firms sometimes obtain contractual
agreements from employees that certain information disclosed to them is
confidential. Courts will accept these agreements as evidence that the firm

17 Becker, supra note 2, at 26: "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."

18 Newberry v. James, 2 Merivale 446, 35 Eng. Rep. 1011 (Ch. 1817). The first reported
American case suggested that an injunction could not issue on the ground that it would be
involved a process for marbelizing iron, slate, and other articles. That dictum was not followed
in Hammer v. Barnes, 26 How. Pr. 174 (N.Y. Sup. Ct. 1863), involving a process for brewing
ale. The leading early American case, Peabody v. Norfolk, 98 Mass. 452 (1868), involved a
process for manufacturing gunny cloth from jute buffs.

19 Restatement of Torts § 757 (1939).
valued the information and attempted to preserve its secrecy, but they decide for themselves whether the information should actually be protected.

The rules of trade secrecy law suggest that the law's coverage is broad but an overwhelming number of the reported cases deal with appropriated process technology—how to make something.20 There are a small number of cases involving knowledge of the identity of customers, and after that, nothing.21

How meaningful the law's protection of trade secrets is to firms is an open question. The "how to steal it" books22 make it clear that the essence of effective trade secret theft is leaving the victim unaware. In this respect the pervasive availability of modern copying or photographic equipment has been a great aid. Since the subject of a secret is something that competitors cannot detect in the course of normal competition, conversely the victim cannot detect the acquisition of the secret by his competitor. For example, production processes are protected by trade secrecy because they can be used but are not disclosed to the world by being used. A stolen process can thus be used by a competitor without alerting the victim to the theft. In one reported case a firm discovered that its trade secrets had been stolen only after it acquired the firm that had received them.23 But if the victim does not detect the theft, he cannot institute legal proceedings.

This detection problem explains the importance of restrictive covenants.

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20 The restrictive covenant cases, on the other hand, most frequently deal with customer contact situations.

21 Blake, supra note 8, at 667. Thus as a practical matter the domains of patent law and trade secrecy appear to be congruent, except that patent law does not extend to customer relations. The ways in which the patent system offsets the deleterious effects of trade secrecy protection are analyzed in Kitch, The Nature and Function of the Patent System, supra note 1, at 275-80. The near congruence of the two regimes may, therefore, reflect an understanding that trade secrecy protection is more desirable when its negative effects are offset by a property rights system. However, the explanation offered below for the scope of trade secret protection is that the types of information not covered by trade secrecy law have high depreciation rates that make legal protection unnecessary. See pp. 713-14 infra. Unlike the patent-related explanation, this explanation can encompass the protection allowed to customer lists.

22 The label is facetious since the purpose of the books is to persuade firms of the need for security measures, but they make their point by illustrating how easy it is to obtain a competitor's secrets. I have located Tom Arnold & David McGuire, The Law and Practice of Corporate Information Security, 57 J. Patent Office Soc. 169, 237 (1975); Harvard University, Graduate School of Business, Competitive Intelligence (C.I. Assoc. 1959); Business Intelligence and Espionage (Richard M. Greene, Jr. ed. 1966); Peter Hamilton, Espionage and Subversion in an Industrial Society (1967); Philip Hickson, Industrial Counter Espionage (1968); Ronald Payne, Private Spies (1967); Paul I. Slee Smith, Industrial Intelligence and Espionage (1970). I have found Smith the most helpful. I have seen references to Jacques Bergier, Secret Armies: The Growth of Corporate Industrial Espionage (Harold J. Salemson trans. ca. 1975), but I have not obtained a copy.

23 Northern Petrochemicals Co. v. Tomlinson, 484 F.2d 1057 (7th Cir. 1973).
It is often impossible to determine whether a former employee who has gone to work for a competitor has taken trade secret information, and whether he has disclosed that information to his new employer. The former employee may give the information to the new firm without disclosing its confidentiality and represent the information as his own to impress the new firm with his value. A restrictive covenant keeps the ex-employee away from the competitor. He can still sell the information, but an explicitly tainted transaction is then required.

The effectiveness of legal proceedings to protect trade secrets is further affected by the risks such proceedings present to the secret. The courts require a plaintiff in a trade secret action to prove that the subject matter of the theft was not generally known in the industry, and that the firm made systematic efforts to keep the information secret. This requires the disclosure of the subject matter of the secret and its related technology to those involved in the litigation process. The courts have developed elaborate confidentiality procedures to deal with this situation.\textsuperscript{24} The information may be disclosed, for instance, only to the defendant's attorney and not to his client, the accused thief.\textsuperscript{25} But even assuming the effectiveness of these procedures, they violate basic precepts of security. Information relating to the secret must be specially assembled and circulated to a new group of individuals, and the litigation itself will signal the value that the firm places upon the information.\textsuperscript{26}

There is no remedy for trade secrecy theft against a firm using the trade secret if the firm acquired the information without being aware of its tainted origin.\textsuperscript{27} Once a secret gets out, problems of tracing will practically assure the victim's inability to stop competitive use. If the perpetrator of the theft is judgment proof and the present holders of the information are innocent, there may be no effective relief.

Another formidable threat to trade secrecy may be foreign espionage. The governments of foreign powers that maintain intelligence services have an interest in upgrading the technological base of their own industries. One peacetime function of an intelligence service is obtaining otherwise unavail-

\textsuperscript{24} These are discussed in Roger M. Milgrim, Trade Secrets in 12A Business Organizations (1979). Milgrim observes: "Perhaps the greatest single drawback to trade secret litigation is the disclosure which plaintiff often must make during the course of the case." \textit{Id.} at § 7.06 [1].

\textsuperscript{25} \textit{Id.}

\textsuperscript{26} A dramatic recent example is the action brought by the U.S. Government to enjoin the publication of plans for the construction of the hydrogen bomb. The litigation revealed that the plans were genuine and led to the revelation that numerous details about construction of the bomb were available to the public in U.S. government libraries.

\textsuperscript{27} Restatement of \textit{Torts} § 758 (1939).
able technological information. It is likely that foreign intelligence services are less sensitive to legal restraints than a domestic competitor would be.

The difficulties of detection and enforcement make this a logical area for the use of strong criminal penalties. Since the number of detectable thefts is small, the activity can only be effectively deterred if heavy penalties are imposed on thieves who are caught. Trade secrecy skillfully executed is not a crime under the traditional criminal statutes. Entry only to copy is not entry with felonious intent and hence not burglary. Information is not the kind of property that falls within the scope of traditional theft statutes. Bribery of an employee to provide information, but not property of the employer, is not a crime. When property is taken, a crime has been committed. In the late 1960s and early 1970s, twenty-six states passed statutes to make trade-secrecy theft a crime. There have, however, been very few prosecutions under these statutes. The statutes came about as the result of a ring organized to steal systematically process secrets and materials from an American drug company and sell them to Italian manufacturers who at that time operated under an umbrella created by the lack of drug patents under Italian law. The ring proved very difficult for the company to break, and the problem highlighted a gap in the criminal laws that many legislatures were willing to fill.

The new statutes require the theft of a trade secret. Therefore, in the criminal prosecution determining whether what was taken was a trade secret is a central issue. The defense must prove that what was taken was not kept secret by the company nor known to other concerns in the industry. To defend on that issue, the defense must ask for large amounts of material relevant to the technology in issue. Procedures for protecting the confidentiality of this material exist, but its assembly and dissemination during the litigation process obviously increase the risk of further loss. In a California case, a convicted thief of trade secrets from IBM argued that his conviction

28 Payne, supra note 22, at 156-95, describes some of the extensive industrial espionage activities of the iron curtain countries. West Germany recently claimed that a major focus of the East German intelligence organization is obtaining information about microelectronic technology. Wall Street J., June 6, 1980, at 16, c. 1.

29 When the thief uses a copying machine or takes pieces of paper, the charge may be theft of services or of the paper. Where these thefts are of low value, the crime will be a misdemeanor.


31 Six cases are cited in the A.L.R. Annotation, supra note 30.

32 Payne, supra note 22, at 35-68, describes this incident.

33 In People v. Serrata, 62 Cal. App. 3d 9, 133 Cal. Rptr. 144 (Ct. App. 1976), the court observed that the trial court did authorize extensive defense discovery of IBM documents and other materials in the possession of the prosecution. IBM also made extensive documentation available voluntarily.
should be set aside because he was the only one who had ever been prosecuted under the statute.\textsuperscript{34} The issue of appropriate proportion between the remedy and the wrong in trade secrecy cases has recently concerned the courts in the area of injunctive remedies. For the last 100 years, courts have routinely enjoined a defendant proven to have wrongfully appropriated a trade secret from using the secret in perpetuity.\textsuperscript{35} Recently, however, defendants have persuaded some courts that the period of the injunction should not exceed the time that it would have taken the defendant to engineer the secret independently.\textsuperscript{36} The trade secret remedy, they have argued, should only make the plaintiff whole, not put him in a better position than he otherwise would have been. The older, still widely followed practice had a punitive element; the defendant ended up worse off than if there had been no theft. In an assumed model in which most thefts are detected, a pure compensation remedy makes sense. But where most thefts are not likely to be detected, a disproportionate remedy makes sense if the courts’ objective is to reduce the amount of trade secret theft.

A complexity has recently been introduced into trade secret law by the interaction of more expansive government regulation and the freedom of information act. Statutes such as the toxic substances control act or the environmental protection act require companies to disclose aspects of their production operations, for instance, the chemicals they manufacture, including intermediates, and the components of plant emissions. The Equal Opportunity Employment Commission requires detailed reports about the composition of the workforce and hiring procedures. The Customs Bureau requires detailed information about exported goods. The Occupational Health and Safety Administration regulates and inspects all workplaces.

The Freedom of Information Act imposes a general obligation on all federal agencies to provide copies of their documents on demand. It contains exceptions to that obligation, one of which is for “trade secrets and commercial or financial information obtained from a person and privileged or confidential.”\textsuperscript{37

\textsuperscript{34} Rejecting the argument as frivolous, the court observed: “The record in this case dramatically suggests the reason why it may be true that section 499c is a statute which has rarely been enforced. Defendant’s prosecution and conviction were the result of an extremely difficult, complicated and expensive investigation instigated by IBM. It is apparent why a private company such as IBM would engage in such an undertaking only rarely and only where, as here, the value of the stolen trade secrets was extremely great. The legal problems involved in prosecuting such an action are also apparent. The record on appeal itself contains thousands of pages of transcript.” 62 Cal. App. 3d 24-25, 153 Cal. Rptr. 153.


\textsuperscript{36} Schelenburg v. Signatrol, Inc., 33 Ill. 2d 379, 212 N.E. 2d 865 (1965). This position is adopted by Milgrim, supra note 24, at vol. 12A, § 7.08[1].

Under the act, firms can make dragnet requests for documents of a given type. The copying necessary to meet these requests is assigned to clerical personnel who may, without realizing it, include in the documents material entitled to the protection of the trade secret exemption. The agency can decide to withhold material identified as sensitive on the ground that the material is a trade secret. The party seeking the information may then challenge the decision to withhold in court. A district court judge will eventually examine the documents, at first in camera, to determine whether they in fact contain trade secrets. If the court holds that the documents are not trade secrets, they must be produced. What constitutes a trade secret is, thus, an important legal question under the freedom of information act.

A different question arises if the agency itself is willing to produce the documents but the original submitter wishes to stop production. Many agencies have, either by regulation or practice, notified firms when requests are received for production of documents originally submitted by the firms. The agencies have tended to see themselves as stakeholders, with no self-interest in whether the documents are produced. The submitter of the document has then sued in the courts to bar the agency from producing the documents. These cases, now considerable in number, have become known as “reverse freedom of information act suits.”

The major legal questions raised by these cases were addressed by the United States Supreme Court last term in the case of Chrysler Corporation v. Brown.\textsuperscript{38} The principal issue was whether the trade secrecy exception to the act was simply an exception to the agency’s duty to produce, or whether it also created a right in the affected third party to object to the production of the document. The Court held that it was only an exception from the duty to produce. Another question was whether production of documents containing trade secrets by an agency was a violation of a long-standing criminal statute that prohibits a federal employee from disclosing confidential business information “to any extent not authorized by law.”\textsuperscript{39} The statute is aimed at the federal employee who, without authority, takes information from the office files and discloses it to others. The question in the case was whether the statute also prohibited an agency from officially releasing confidential information unless it was expressly authorized to do so by statute. The Court held that it did not. Agencies have inherent power to control their records and, in the absence of statutory provisions prohibiting disclosure (such as exist, for instance, in the income tax area), an agency is free to choose to disclose. Finally, the Court held that the supplier of the information was an

\textsuperscript{38} 99 S. Ct. 1705 (1979).

aggrieved party who had the right to participate in the procedures that led the agency to decide whether to release the information.

These developments are a major change in American trade secret law. In an action for violation of trade secrecy rights the plaintiff has to show that the information is secret. If the defendant can show that the information is available in government files, and that the government would make those files available, the trade secret right disappears. Firms will probably be able to persuade many agencies to protect the most sensitive documents on the ground that protection of trade secrets is a long-established legal right which Congress has shown no explicit desire to disrupt, and that failure to recognize the right will reduce the firms' cooperation with reporting requirements. But where an agency determines to release the material, it is unlikely that firms will be able to persuade the courts that the decision is an abuse of discretion. The agencies face the problem of making regulatory decisions on the basis of the data submitted to them. If the relevant data are kept secret, the procedures and basis for their decisions must be secret. If the decisions are challenged, it is difficult for the agency to defend itself. Thus trade secrecy in this context generates the kind of closed government the freedom of information act is designed to combat. The firms can argue that failure to recognize trade secrecy claims is unwise because it will create incentives for firms to obscure documents they submit to the government. But the argument will be unattractive to a court, because it seems to be a threat by the firms not to meet their legally required reporting obligations. Thus the long-established regime of American trade secrecy law is now under an amorphous and apparently inadvertent pall.

The courts require the plaintiff in a trade secrecy case to show that the taking of the secret was improper. Thus, a disclosure by an employee in violation of his fiduciary obligations to his employer, or a taking involving theft or fraud, is actionable. By contrast, a competitive firm can legally conduct a systematic and sustained investigation of a competitor in order to

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40 The tension between open government and central economic planning is elegantly explored by Lon L. Fuller, Governmental Secrecy and the Forms of Social Order, in 2 Nemos: Community 256 (Carl J. Friedrich ed. 1959).

uncover confidential information. Firms often ask their salesmen, for example, to report information provided to them by customers about the activities of competitors. The subject may come up naturally in the course of sales presentations where comparative comments or questions are to be expected. Salesmen may also be instructed to exploit any opportunity that comes up for learning about a competitor, such as overheard conversations. It would be quite easy to construct a theory that the information in possession of these firms has been provided to them in confidence only for the purpose of assisting their buying decisions, and that the competitor's concerted effort to obtain that information is an improper effort to induce breach of that confidence. Under the traditional rule, however, improper means has meant something more than systematic surveillance. "In general," says the Restatement, "they are means which fall below the generally accepted standards of commercial morality and reasonable conduct." "Examples of such means are fraudulent misrepresentations to induce disclosure, tapping of telephone wires, eavesdropping or other espionage."42 And, cautions the Restatement, "liability . . . is based not on the actor's purpose to discover another's trade secret but on the nature of the conduct by which the discovery is made."43

In E.I. DuPont DeNemours & Co., Inc. v. Christopher,44 DuPont complained that the defendants, professional photographers, had taken aerial photographs of a DuPont plant under construction. The photographs were of a portion of the plant being set up to use a new, secret process for producing methanol that DuPont believed would give it a competitive advantage. At the time of the photograph the roof of the plant was not completed and parts of the process were exposed to view from directly above the construction area. DuPont claimed that photographs would enable a skilled person to deduce the process. DuPont claimed that the company had taken special precautions to safeguard the secrecy of the process, but that it would have involved extraordinary and otherwise unnecessary expense to keep the production line concealed from aerial view until the roof was completed. The United States Court of Appeals for the Fifth Circuit held that DuPont had a right to damages and injunction against these actions.

One question the case presents to the reader is why DuPont brought the case at all. Bringing the case would seem to signal that the photographs were valuable and would spur on the effort to deduce the process from them. Bringing the case itself would seem to increase the risk of loss on the facts alleged. Several answers suggest themselves. The appearance of the airplane

42 Restatement of Torts § 757 Comment f.
43 Id., Comment g.
44 431 F.2d 1012 (5th Cir. 1970).
at such an opportune moment suggested to DuPont that some kind of inside leak had tipped off the photographers (or their client) to the opportunity. The action might enable DuPont to identify that leak and stop its future occurrence. DuPont may have wished, in a sympathetic litigation situation, to establish a legally recognized privacy expectation against aerial surveillance of its industrial facilities. That expectation could then be used as the basis for suppressing evidence obtained by government agencies, such as the Environmental Protection Agency, from warrantless photographic overflights.\footnote{\textit{\textsuperscript{45}}}

The court found no controlling precedent. The defendants argued that aerial photography of property not owned by the photographer was perfectly legal and not improper in any way. The court rejected this argument with sweeping language. “To obtain knowledge of a process without spending the time and money to discover it independently is \textit{improper} unless the holder voluntarily discloses it or fails to take reasonable precautions to ensure its secrecy.”\footnote{\textit{\textsuperscript{46}}} The court continued:

Our tolerance of the espionage game must cease when the protections required to prevent another’s spying cost so much that the spirit of inventiveness is dampened. Commercial privacy must be protected from espionage which could not have been reasonably anticipated or prevented. We do not mean to imply, however, that everything not in plain view is within the protected vale, nor that all information obtained through every extra optical extension is forbidden. Indeed, for our industrial competition to remain healthy there must be breathing room for observing a competing industrialist. A competitor can and must shop his competition for pricing and examine his products for quality, components, and methods of manufacture. . . . To require DuPont to put a roof over the unfinished plant to guard its secret would impose an enormous expense to prevent nothing more than a school boy’s trick.\footnote{\textit{\textsuperscript{47}}}

There are two branches to the implied argument. First, the law should not create incentives for otherwise wasteful expenditures by refusing to provide legal protection. Second, to permit this kind of information taking will result in an incorrect level of investment in innovation.

a. \textit{Prevention of wasteful expenditure}. The court argues that to deny legal protection to DuPont would be to create an incentive for a wasteful expenditure—some form of temporary roof solely for the purpose of protecting the trade secret during construction. On the facts, the argument is unpersuasive. The existence of a cause of action will affect the decision whether to build the roof only if the cause of action significantly affects the probability

\footnote{\textit{\textsuperscript{45}} It has subsequently been revealed that between January 1976 and April 1978 the EPA took aerial photographs of at least 118 private industrial facilities. National Legal Center News, First Quarter, 1979.}

\footnote{\textit{\textsuperscript{46}} 431 F.2d 1015-16.}

\footnote{\textit{\textsuperscript{47}} 431 F.2d 1016.
of successful use of aerial photography to obtain the secret. In the case, the aerial photography was apparently conducted at a low altitude and in a manner that attracted the attention of DuPont employees, who were able to observe the registration number of the plane. But if equally useful photographs could be taken with more powerful lenses at 15,000 feet, then the only effect of the cause of action might be to cause the photographer to behave differently. If so, DuPont would have the same incentives to conceal the production line during construction.

The argument raises a general question about trade secret law. Why do the courts require that the plaintiff show, as a condition of recovery, that he has expended resources keeping the information secret? Are not all such protective expenditures wasteful? Property rights are not usually lost because the owner has not expended sufficient resources to protect them. In DuPont the court balked at the notion that DuPont should have erected a giant cover. But how does the court know that that expenditure is too much?

Perhaps what the courts require in trade secret cases is that the firm have made sufficient expenditure so that there is a reasonable probability that the secrets are in fact secret. The courts, this reasoning would go, should not spend their time trying to protect trade secrets when, in all probability, the information is not secret anymore because no effort has been made to protect it. The problem with that argument is that the plaintiff apparently thinks the secret has value, for he is willing to invest in the litigation. Why should he also be required to invest further in keeping the secret secret? Indeed sometimes the most effective way to protect information (or an object) of value is by treating it as if it were not valuable. The courts have sometimes held, for instance, that public tours of a plant which allowed tourists to observe a secret process in operation destroyed the trade secret even though there was no showing that casual observation was likely to lead to competitively harmful disclosure of a secret. A closed section of the plant prominently posted, "Restricted area, do not enter," as is recommended in the how-to-do-it books, may simply inspire efforts to learn what is within. One thinks of a violent armed robbery of an armoured car, while the innocuous messenger walks nearby, $3,000,000 in negotiable securities in his pocket.

Another explanation for the requirement might be that the courts insist on sufficient investment so that the employees know that confidentiality is claimed for the information involved, and so that the employer is not free to

48 A common injurious information leak is "public relations tours through your facilities. These are dangerous not only because they are useful to industrial espionage agents, but because when discussed in court it sounds to judge and jury like more information was given away or revealed by the company than was the fact. Judge and jury are biased to give the event bigger significance than it merits in real life." Arnold, supra note 22, at 170.
49 Id. at 171-72.
claim later that some information acquired by the employee is secret even though he was not notified of it at the time. The trade secret cause of action could possibly be used to foil the policy of free movement of employees unless confined to information that the employer has shown a consistent and meaningful desire to protect. The trade secret cause of action is not contractually based and thus there is no contractual process to notify the employee of the extent of his fetters. Only if the courts require a consistent policy of overt protection would the trade secret cause of action not be used to frustrate the law's policy of free movement. Thus DuPont can be viewed as consistent with this law in that DuPont had done what was necessary to make it clear to its employees that the process was confidential. The only purpose of the special roof would have been to deter surveillance by third parties.

b. Appropriate investment incentives. This part of the court's argument is precisely the same as the standard argument made for patents. Unless DuPont can keep the information about its new process for producing methanol away from its competitors (or charge them for it), its return on the process will be the competitive return, and it will get no return on the cost of developing the process. If taken seriously, the argument implies that the courts should fashion property rights to overcome the information externality problem. This the Supreme Court once did in the famous case of International News Service v. Associated Press,50 where it gave to the Associated Press a common law cause of action against the International News Service for copying its uncopyrighted news dispatches. The case has been controversial and little followed. This aspect of the court's rationale, however, creates ambiguity about the scope of its holding.

It has long been considered legal to copy a competitor's product. There is strong, recent Supreme Court precedent which holds that such a right is protected by federal law.51 But this is a feature of the law inconsistent with the economic reasoning in Christopher. It means that trade secret law generates contorted incentives: industrial processes that can be protected by secrecy are favored and product innovations that are necessarily revealed to competitors are disfavored. The force of the precedent means that the question is unlikely to be reopened, but the reasoning of Christopher may affect some borderline cases.

The borderline cases arise when a seller attempts to restrict the flow of information to his customers in a way that restricts its availability to his competitors. Can he impose contractual restraints on his customers that have the effect of making the efforts of his competitor to obtain this information "improper"? For instance, computer programs have been held by the

Supreme Court to be unpatentable. Can the seller of machines embodying programs, or of manuals describing programs, require each purchaser or lessee to sign a contract which states that "the purchaser and the seller agree that this program is being sold to purchaser for the sole purpose of use in machine serial number ________, that purchaser will make no disclosure of the contents of the program to any other person except those personnel involved in the operation of the program, and then only to the extent to enable purchaser to use to program"? The seller might also send a letter to his competitors, informing them that all of his programs are subject to agreements of confidentiality and that any effort by the competitor to obtain the information will be an improper effort to induce a breach of contract. Or a seller of an electronics device might place the critical part of the device within a sealed closure and place the following inscription upon it: "This machine is [sold] [leased] upon condition that [buyer] [leasee] agrees not to unseal this closure. The contents within are the trade secrets of the seller. May be maintained, repaired, or replaced, only by employees of seller or authorized personnel subject to convenants not to disclose its contents." (Or, perhaps, the label should suggest, the device will self-destruct unless opened in a proper way.) Another possibility is to distribute a product with no portion of it particularly concealed, but bearing a general legend: "This product incorporates various trade secrets of the X Corporation and is [sold] [leased] on the understanding that the secrets are not to be disclosed to any person and that this product is only for the use of [buyer] [leasee]."

The courts have long recognized that trade secret information can be disclosed to others under conditions that preserve its secrecy. In fact, two leading trade secret cases involve disclosures made without any explicit contractual restriction to third parties, one of a product design to a prospective purchaser and one of a production pattern to a firm retained to repair it. In both cases, the courts had no trouble in concluding that the third party had accepted an implied confidentiality pledge when the information was disclosed, and that the pledge was enforceable.

52 Some of these questions are explored in Peter B. Maggs, Some Problems of Legal Protection of Programs for Micro Computer Control Systems, 1979 U. Ill. L. Forum 453. These types of conditions have proven effective with courts in the computer industry. See Digital Dev. Corp. v. Int'l Memory Systems, 185 U.S.P.O. 136, (S.D. Cal. 1973) (no injunction, damages only for product copying); Data General Corporation v. Digital Computer Controls, Inc., 357 A.2d 105 (Del. Ch. 1975) (manufacture of machine designed from plaintiff's drawings provided in confidence to customers for purposes of maintenance enjoined for period of time required to reverse engineer). The plaintiff, however, was denied a preliminary injunction in Data General because of uncertainty on the factual issue of secrecy. 297 A.2d 433 (Del. Ch. 1971), aff'd 297 A.2d 437 (Del. Super. Ct. 1972).

53 Smith v. Dravo Corp., 203 F.2d 369 (7th Cir. 1953).

In the case of sales such contractual restrictions would run into the courts’ long-standing aversion to restraints on purchasers of property. The courts maintain the position that a sale should give the purchaser absolute dominion over the property. That can be avoided by the leasing form, yet widespread leasing is likely to destroy the secrecy of the information and hence its legal protection. That would, of course, not apply in the case of hidden or sealed technology that did not become known to the leasee in the course of his use. In that narrow class of cases, *Christopher* may presage judicial protection.

2. *Other Information*

The rest of the law of commercial privacy presents a more confused pattern.

Hornbook statements of trade secrecy law apply to all information. The Restatement says that “a trade secret may consist of any formula, pattern, device or compilation of information which is used in one’s business, and which gives him an opportunity to obtain an advantage over competitors who do not know or use it.” This sweeping definition is followed by a list of illustrations, all but one of which is a technology. “It may be a formula for a chemical compound, a process of manufacturing, treating or preserving materials, a pattern for a machine or other device, or a list of customers.” And, adds the Restatement, “it differs from other secret information in a business in that it is not simply information as to single or ephemeral events in the conduct of the business, as, for example, the amount or other terms of a secret bid for a contract or the salary of certain employees, or the security

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55 Merchants Suppliers Paper Co. v. Photo-Worker Corporation, 29 A.D.2d 94, 285 N.Y.S.2d 932 (1967). (Owner of machine is free to copy it in competition with seller even if he has promised not to.) “The plaintiff passed title and having done so cannot exercise dominion over their product.” 29 A.D.2d 96, 285 N.Y.S.2d 935. Turner states that disclosure, even in confidence, to a large section of the industry will destroy secrecy. Amélie E. Turner, The Law of Trade Secrets 30-31 (1962). In Board of Trade v. Christie Grain & Stock Co., 198 U.S. 236 (1905), Mr. Justice Holmes stated for the Court that “The Plaintiff does not lose its rights by communicating the result to persons, even if many, in confidential relations to itself, under a contract not to make it public, and strangers to the trust will be restrained from getting at the knowledge by inducing a breach of trust and using knowledge obtained by such a breach.” *Id.* at 250-51. The information protected in *Board of Trade* was current quotations from the floor and the protection was for a duration of a few minutes. There are cases that protect specialized teaching methods against former students who have signed confidentiality agreements, even though the plaintiff is seeking to teach the secret to anyone who will pay his fee. The protection, however, is against use of the secret in competitive teaching, not use of the secret in the former student’s business. Smok Enders, Inc. v. Smoke No More, Inc., 184 U.S.P.Q. 309, (S.D. Fla. 1974); Ultra-Life Labs. Inc., v. Eames, 240 Mo. App. 851, 221 S.W. 2d 224 (K.C. Ct. App. 1949).

56 Restatement of Torts § 757 Comment b.

57 *Id.*
investments made or contemplated, or the date fixed for the announcement of a new policy or for bringing out a new model or the like. A trade secret is a process or device for continuous use in the operation of the business. 59

Almost all of the pure trade secret cases—namely, those not arising in the context of restrictive covenants—involves information about production methods or the appropriation of detailed customer information, usually a written list of customers. This may either be because the law does not provide additional protection or because other kinds of information depreciate so rapidly that litigation is not worthwhile.

In a separate section, the Restatement announces the position that "one who, for the purpose of advancing a rival business interest, procures by improper means information about another's business is liable to the other for the harm caused by his possession, disclosure or use of the information." 60 The scope of the kinds of information included within this section is larger than that protected by trade secret law. It "applies to information about one's business whether or not it constitutes a trade secret." 61 The important differences between the protection supplied under this principle and trade secret protection are two. First, protection of a trade secret is a legitimate interest of an employer that will support a restrictive covenant. Second, in many cases it will be difficult to show harm and therefore an injunction will be unavailable. In many situations a firm will benefit from information obtained from another firm, but there will be no harm. For instance, it might help a seller of wheat to know about a competitor's study of market trends, but such knowledge is unlikely to affect the price of wheat and harm the competitor. Generally the transfer of information from one firm to another in competitive markets is likely to help the second but not injure the first. Of course, if the information has an impact on the costs of the industry as a whole it will, as it spreads through the industry, affect the cost structure of the industry and the profitability of the first firm. Identification of particular damages flowing from any single "improper" taking, however, will be difficult.

Principles from two other areas of law, trusts and restitution, are relevant here.

Under trust law a fiduciary who receives something of value holds it for the benefit of the object of his trust. It is often said that employees generally, and particularly employees in positions of managerial responsibility, have a fiduciary duty toward their firm. If they receive information in their capacity as employees, it can be argued that they hold this information in trust for the

59 Id.
60 Id. at § 759.
61 Id. at § 759, Comment b.
employer. The argument, if generally applied, would undermine the principle of free employee mobility, for employees would be unable to use the information acquired on the job for the benefit of anyone but the employer.

In a narrow class of "corporate opportunity" cases, this approach has been followed. These are cases involving a proposal by a third party, intended for the firm, for some specific business undertaking. In the cases, the employee learns of the information—a proposal to acquire a particular business, or to begin a business in some place or product line, or to adopt a type of selling technique, etc.—and decides to exploit the information for himself rather than the firm. The paradigm case involves a corporate president who decides to take advantage of the deal not for the benefit of the corporation but for himself. In these cases the courts provide remedies to enable the firm to recapture the fruits of the information. The employee may be forced to turn over his profits, or the resulting business itself, to the firm.

The basic principle of restitution is that unintended windfall gains (unjust enrichment) can be recaptured by the person who confers them. For instance, if I return some papers to you and unknown to me a $100 bill belonging to me is hidden among them, I can compel you to return the bill. The principle operates in contexts where the parties have no preexisting contractual relationship relating to the matter. This doctrine is used in a group of cases that can be called the "idea-submitter cases." In these cases an outsider communicates information to a firm—an idea for a book, a television series, an advertising gimmick, a business method, an invention—without any prior understanding about the obligations of the firm. The submitter and the firm reach no agreement about the use of the information or any compensation of the submitter, but the firm uses the information anyway. Many courts will "return" the benefits of the information to the submitter.

Consequently, many firms establish regular policies to deal with idea submitters. These policies involve procedures for isolating and retaining records of the submission and refusing to consider them until the submitter signs a contract limiting the firm's possible liability.

These rules can be more coherently organized for purposes of functional analysis if the traditional legal categories are dropped. The analysis that follows is organized under the headings of (a) information outbound from the firm, (b) information inbound to the firm, and (c) information transactions.

62 5 Austin Scott, The Law of Trusts § 505, at 3564 (1965): "Where a fiduciary in violation of his duty to the beneficiary acquires property from a third person through the use of confidential information which he obtained as a fiduciary, he holds the property upon a constructive trust for the beneficiary."

63 This law is summarized in 5 George E. Palmer, The Law of Restitution § 10.11, at 463-77 (1978).
The analysis suggests that the real concern of these rules is not protection of exclusive control over information of value but rather the preservation of the institutional integrity of the firm so that it can have a current accounting of its information stock. Indeed, the rules seem to assure that information of real value will be transmitted out of the firm unless it falls within the trade secrecy classification.

a. Outbound information. The rules effectively distinguish between information carried out of a firm by a departing employee and information obtained in other ways.

The breadth of an employee's right to carry information out of a firm is shown by many of the restrictive covenant cases. Not atypical is Reed, Roberts Associates, Inc. v. Strauman. The plaintiff was a firm that supplied advice to employers on compliance with state unemployment laws. The defendant had signed a restrictive covenant. He had worked ten years for the plaintiff in internal administration, rising to a top management position. The firm's product involved telling firms about the requirements and policies of state unemployment compensation laws, publicly available information (although not without cost). The defendant was in management, not sales, so he had no customer contacts. He did, however, know a great deal about the business, including presumably its profitability. After ten years, probably influenced in part by its profitability, he quit and started his own firm offering the same service.

The plaintiff's employment did not fall into the category to which restrictive covenants can be applied, so the court held the restrictive covenant unenforceable. "Apparently," said the court, "the employer is more concerned about Strauman's knowledge of the intricacies of their business operation. However . . . we cannot agree that Strauman should be prohibited from utilizing his knowledge and talents in this area . . . . A contrary holding would make those in charge of operations or specialists in certain aspects of an enterprise virtual hostages of their employers.""

Another example of the freedom of the employee to carry information, even highly specialized information, out of the firm is nonrestrictive covenant cases where the employee has taken identifiable, valuable information but the court refuses relief because the information is not a trade secret. In Wexler v. Greenberg the defendant was a chemist who had been employed to formulate the firm's sanitation and maintenance chemicals, which he did by analyzing the products of competitors and duplicating them. He would

then modify the product so that it was not an exact copy. The defendant
going to work for a competitor, which immediately began to manufacture
products that the defendant had developed for the plaintiff. The court held
no remedy, because the formulas “form part of the technical knowledge and
skill he has acquired by virtue of his employment with Buckingham and
which he has an unqualified privilege to use.” The case is somewhat unusual
in that the defendant himself developed the very formulas he took, and the
court intimated the result might have been different if an explicit entrusting
of secret formulas had occurred. But the case is striking because product
formulas are generally protected by trade secret law. An alternative reading
of the case is that the formulas were not protectible because they were so
easily discoverable by reverse engineering and, hence, were not secrets.
Even so, they had value since it would have taken time and effort to repeat
the process of reverse engineering.

Another case of this type is E. Worsley & Co., Ltd. v. Cooper.67 The
defendant had been the key operating manager and salesman for a firm that
sold paper to businesses. The firm was a sales intermediary, soliciting orders
from firms and filling them with paper in stock or by orders from the mills. It
had prepared an elaborate order book showing the various kinds of paper
available. The book did not disclose the origins of the papers, and the firm
did not make that information available to its customers. The defendant left
the plaintiff’s employ and immediately set up a competing business with a
price list that tracked the order book of the plaintiff. He was able to fill the
orders because he knew the mills which supplied each of the various kinds of
paper and their charges. The plaintiff argued that this was confidential
information that the defendant could not use. The court refused to provide
relief on this aspect of the case. “It was the use of his knowledge, skill and
experience gained in the plaintiff’s service, and I do not think it can be said
that the origin of the paper was anything in the nature of a secret process.”68

This result changes if an employee provides information while still em-
ployed by the firm. If an employee uses the resources and information of his
employer to organize a new competitive firm, there is a cause of action.69 It is
also illegal for a third party to obtain information from a firm by paying one
of its employees to provide it on the side. This raises the question why it
should be legal for an employee to take information if he leaves the firm but
illegal to sell it while he is employed. Why should the courts bar this method
of information transmission?

68 id. at 309-10.
69 I.e., the employer organizes the competitive firm before he quits. See, e.g., Wear-Ever
b. *Inbound information.* Employees cannot intercept any kind of information coming into the firm and use it in competition with their firm. The scope of effective protection provided the firm is much broader than in the outbound cases. However, if the employee communicates the information to the firm and the firm decides not to use it, the employee becomes free to use it as long as his use is not competitive with the firm.

These rules seem concerned not with protecting the firm's exclusive control over information but with protecting the decision-making integrity of the firm. Employees are thus entitled to take information out of the firm, but if they do so they must tell the firm. They cannot remain with the firm and secretly exploit information in competition with the firm. Conversely, employees cannot screen out information coming into the firm and select the best for their own use, thereby distorting the firm's internal decision-making process.

The operation of the rules can be illustrated by an information problem that has received some attention in the literature—securities transactions by executives of a firm. The common law approach to this problem has now been significantly displaced by rules imposed by the Securities Exchange Commission under federal statutes. The common law approach was to permit executives of firms whose securities were traded on public exchanges to use information gained about the firm as a result of their positions to make profitable transactions in the securities of the firm.\(^7\) The courts found that the firm itself was not in the business of trading in its securities and that the firm had not imposed any contractual restraint on such use of the information. Insider trading did not involve the use of information that had not been provided to the firm itself. Thus, the application of the general rules led to the holding that insider trading was permissible.

This law has been partially displaced by federal securities regulation. Executives cannot benefit from their knowledge of discrete pieces of insider information to profit in the securities market. The most notorious example involved transactions by executives of Texas Gulf Sulphur who bought shares of the corporation on the basis of information about a potentially large sulphur find before that information had been made public. Executives can still buy or sell stock of their companies, even if their decision is based on their knowledge of the company, as long as it is not related to some identifiable, discrete, and material piece of information not known to the public. If an executive decides on the basis of his dealings with the new president that the man will not work out, or that he has made a series of decisions harmful to the company, the executive can sell his stock and benefit thereby if the stock price goes down, even if his judgment about the new man is information that is not available to the market generally.

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c. Transaction cases. The contractual transmission of information whose value is not effectively shielded by a property right is very difficult. The two sides must exchange information about the value of the information being exchanged while retaining the option not to complete the transaction if they are unable to reach agreement on terms. If a property right shields the value of the information, then the information can be freely exchanged because it is of no value unless the property right is also transferred. For instance, information about the inventory of a plant is of little value unless the plant is purchased. The patent system creates a property rights framework in which trade secret information about technology can be exchanged since the information will have little value unless the patent is also licensed.

There are contractual solutions to these problems. The negotiating parties can enter into a contract specifying the information to be disclosed and what can and cannot be done with it, even if no final deal is made. The seller of the information can warrant its value, or some of its quality parameters, and a penalty schedule can be agreed upon if the information falls short of the warranty standards. Payments for the information can be spread over the time period that the information will be used, and the amount of the payments made dependent on measures of the value of the information.

The problems that have bothered the courts have arisen when explicit understanding on the ground rules is missing. There are two principal types of cases. One involves an outsider submitting a business idea to a firm. The idea can be an advertising concept, a business proposal, or an idea for a new product. The other type of cases involve the submission of ideas for a book, play, movies, T.V. show, or whatever, by an author to a publishing or production firm. In the cases the submission has occurred with no advance understanding, the firm has apparently rejected the idea, and then gone ahead and used it. Many courts have held that if the plaintiff can demonstrate that the idea was submitted and that the firm used it, there is a liability. The effect of these holdings is to impose an obligation to pay on the firms unless they contract out of it. The justification for this approach seems to be that ground rules are necessary to make such transactions possible. In determining what the contract is in the absence of agreement, the courts have chosen a form of contract that puts the contracting burden on the firm. This approach is economically justifiable if firms can, at lower cost than the submitters, set up procedure and draft contracts for such situations.

One case in which relief was denied involved a plan, conceived around 1900, to combine the lead companies of the United States, not already a part of the National Lead Company, into a single company.71 The complaint alleged that the plaintiff, having conceived of this by then not terribly original scheme, approached the defendant, apparently a man of considerable

71 Haskins v. Ryan, 71 N.J.Eq. 575, 64 A. 436 (1906).
capital, with the idea and proposed that he should carry it out in cooperation with the plaintiff. The defendant did carry it out, but not in cooperation with the plaintiff. The plaintiff sued for a share of the defendant's profits from the consolidation. The court said there was no cause of action because the plaintiff had no property right in his idea. It would be equally persuasive to say that in this context, negotiations between two sophisticated businessmen, the burden should be on the idea submitter to extract any predisclosure agreement. The cases in which plaintiffs have been successful have been those of non-businessmen against firms, such as movie companies, with an explicit policy of accepting and using proposals and ideas submitted by outsiders.

II. WELFARE ANALYSIS

A conventional analysis of the law just sketched is as follows. The rules do not serve social welfare because they provide no incentive to firms to invest in information. Not only is information of value inherently difficult to protect but, outside the core trade secrecy area, the courts leave employees free to leave the firm and exploit the information in competition with the firm. This competition eliminates the return that would otherwise generate the incentive for investment in the production of that information.72

Take, for instance, the problem of identifying and exploiting profitable markets. Standard price theory analysis depends on firms having an incentive to identify and exploit profitable markets for the argument that market organization generates allocational efficiency. Yet if firms have no ability to control the information, the profit in the market will be dissipated before they can exploit it. As soon as the profitable opportunity is identified, employees will leave the firm to exploit it. It is true that employees can be retained with “golden handcuffs,” but to be effective the payments must equal the value of the information to the employee if he leaves, and such payments will eliminate the profitability of the information. Even this tactic may not work since the aggregate “golden handcuff” payments cannot exceed the value of the information, whereas any single employee may be in a position to appropriate its full value.

72 Jack Hirshleifer, The Private and Social Value of Information and the Reward to Inventive Activity, 61 Am. Econ. Rev. 561 (1971), points out that it is possible to gain from new information by exploiting its effects on prices, and that this source of gain may exceed the socially optimal level. Eugene Fama and Arthur Laffer have formally analyzed this aspect of the problem in the context of information production in securities markets, arguing that the optimal producer of information about the corporation is the corporation itself because the corporation has an incentive to take into account both gains and losses to its shareholders. Eugene Fama & Arthur Laffer, Information and Capital Markets 44 J. Bus. 289 (1971). This aspect of the problem is not considered here, reflecting my view that transaction costs make it unimportant.
The problem of lack of incentives to invest in information seems further complicated by the difficulty of transacting in information. Once information is produced, it is socially wasteful to create a situation in which other firms have an incentive to produce that information again unless production is cheaper than transmission. But information transactions are difficult. Not only are there the aforementioned transactional problems, but there is the problem of the interdependence of transactions. The value of information to firm B is interrelated with whether that information will be provided for firms C, D, E, F, and so on. Yet if the transaction involves information that can be protected only through secrecy, it will be difficult for firm B to know whether the information is being provided to other firms. “Shhh!,” the seller will wisely caution everyone. If that contingency cannot be monitored, however, the buyer will not know what to pay for the information.

These difficulties suggest that the industrial property systems should be extended beyond the limited domains of patent and copyright to embrace all information of commercial value. The problem is that it is difficult to imagine how property rights would be defined in such a system. Suppose a firm determines that provision of fast food hamburgers is a highly profitable market. Suppose further (which seems most unlikely) it is the only firm to have reached that conclusion. Is its right to be the exclusive right to exploit all future expansion in the market? For how long a period of time?

This logic also suggests that successful firms in the present legal environment should be preoccupied with secrecy about their affairs. They should want as much as possible to keep suppliers, employees, and customers from transmitting information about the firm to competitors. If secrecy is the only way in which many types of valuable information can be protected, firms should strive to keep valuable information to themselves and the economy should be full of firms engaging in duplicative efforts to reinvent the wheel. Yet casual empiricism suggests that this is not in fact the way firms operate. The how-to-steal-your-competitor’s-secrets literature is full of convincing examples of how information about competitors can be obtained. One simple technique is to advertise in the city where the competitor’s facilities are located for jobs involving the matter in which you are interested. The ads offer an unusually high salary and indicate that interviews are being held at a certain hotel. The competitor’s employees appear and are subjected to extensive interviewing, in the course of which they are induced to talk in detail about how valuable they are, that is, what they are doing for their present employer. At the end of the day, the interview team slips away and is never heard from again. It is even possible through the use of carefully targeted ads to draw out particular employees by drafting the job description so it clearly fits the target. Suppliers are an equally easy target. “I hear you are supplying X Company with new machinery for their production line. We’re thinking about redoing our line. What can your machinery do? My,
that's strange, I thought X used the rebar process. Are they changing their process setup? We're exploring use of the S system, but we've decided it won't be economical unless we can obtain machines that meet these specifications. Can you demonstrate that they work reliably?" It is not difficult to think of ways in which companies could combat these approaches. Employees could be told to report such interviews. Local advertising can be monitored and ringers sent to the interview. Suppliers and customers could be required to pledge secrecy.

Not only do firms not seem to engage in such defensive measures, but in many ways they actively disseminate information about themselves. An undertone in the how-to-steal literature—one purpose of which may be to sell security services—is how careless firms are with valuable information. The trade presses are full of articles on new technologies and procedures. Firms regularly send employees to conferences and meetings on their professional specialties where they discuss their work in the presence of employees of other firms. Firms regularly hire consultants to advise on sensitive business problems, and one of the important qualifications of the consultants seems to be that they know the industry well—they have offered similar consulting services to the competitors.

Another bit of evidence that the real world does not operate as logic suggests is that California, a state that seems to harbor a disproportionate number of technologically progressive companies, does not permit any restrictive covenants to be enforced, even in the trade secrecy area. One would think that if legal protection of trade secrecy were of any significance, there would either be pressure from the firms to change the rule or this would be a significant factor in the location of such activities.

Another bit of evidence is a recent survey of high technology firms in the Boston area to determine if their efforts to maintain trade secrecy were increasing. The hypothesis that led to the survey was that given the increase in the difficulty and cost of enforcing patents, one should expect to see firms substituting secrecy protection for patents. The survey found no such ef-

73 I have systematically read the Oil and Gas Journal, which has long technical sections written by the personnel of firms in the industry. One purpose of the articles seems to be to find purchasers for the company's technology.


75 William L. Casey, Jr., John E. Marthinson, & Laurence S. Moss, Trade Secrecy and
fect. The authors of the survey attributed this finding to a weakened effectiveness of trade secrecy due to the new federal government regulation. It is debatable whether these relatively new statutes have already had so much effect. An alternative explanation would be that the secrets are already quite safe, and that additional efforts would have almost no effect.

These difficulties in the socially optimal incentives for the investment in and dissemination of information can be accepted as an unfortunate fact of nature. If they cannot be overcome, they cannot.

These problems are, in larger compass, the paradox of the efficient markets literature. The modern scholarship of finance has shown that securities markets are so efficient that all, or at least most, investors will do better if they select securities at random rather than invest after trying to identify good investments. But if this is so, who has an incentive to invest in providing information to the market so that it is efficient? If no one has an incentive, how can the market be efficient?

The remainder of this essay attempts to identify aspects of the information problem that makes the argument just developed false. There are three key ideas. First, information is self-protecting. Second, production and utilization occur within firms, not through property and contracts; indeed, this is a key area where firm organization has a comparative advantage over contract organization. Third, markets themselves transmit information between firms.

A. Information Is Self-protecting

This argument has both a supply side and a demand side. On the supply side the argument is that information is difficult to steal. The demand side argument is that nobody can profit by stealing it. Together they operate to make information more secure than it seems.

1. Difficult to steal

This point should not be unfamiliar to a teacher who has had the experience of teaching a course and then discovering that many of the students did not understand most of the subject matter. Nor should it be unfamiliar to the author of an article who has had the experience of discovering that many of his readers completely misunderstand it. Information of any complexity is difficult to transmit. The examples just given are drawn from an enterprise whose purpose is to communicate information successfully. It is much more

Patenting: Complementary or Substitutable Activities? (1978) (unpublished paper at Babson College, Wellesley, Mass.). This is not to say that businesses do not have trade secret protection programs. See, e.g., Vigilant Firms Strive to Keep Their Secrets by Plugging up Leaks, Wall Street J., July 28, 1972 at, 1 c. 1.
difficult to obtain information when it is organized in a form not designed to facilitate communication. Imagine a highly efficient plant which employs some 500 people. It is unlikely that all the information making that plant operate as efficiently as it does would exist in a single place. There is old Joe down there in charge of the paint room. He runs a very good paint room, but the general manager probably does not have the slightest idea how he does it. All the general manager needs to do, to protect the firm against Joe's death, retirement, or departure, is make sure that Joe has trained the night-shift supervisor and his vacation stand-in. If the productivity of the paint room does not fall when Joe takes his month-long summer vacation, the manager can be reasonably confident that the stand-ins understand the system. If a few employees know the system, the firm is protected against the departure of any one. Conversely, if Joe were to defect to a competitor, it is not clear that Joe's knowledge would be of much value. The competitor's paint room is probably set up quite differently. The physical layout is different and the product comes off the assembly line in a different condition. For instance, Joe's employer does final finishing in the paint room, whereas the competitor does it in a different department. The key to the productivity of Joe's operation has been that finishing and paint preparation go on simultaneously. Joe may not even know that is why the paint room is productive.

Managers can avoid increasing the ease with which this information can be transmitted by resisting the temptation to assemble the information in organized written form. Thus the firm might choose not to prepare a detailed manual which explains in useful detail: "Operating Procedures for the Efficient Production of Ethanol of Plant A." Managers might choose instead to review the operating procedures for segments of the plant, set operating standards for the operation of those segments, and hold the segments to those operating standards without writing down in one place how those standards are to be met.

The difficulty of stealing valuable information is further compounded by the likelihood that it is embedded in a context that contains a great deal of extraneous information. Think of the problems confronting the analyst of the aerial photographs of DuPont's plant. Suppose he suspects that the photographs will provide information about the process. But which aspects of the photograph? Which machine is the key?

It is this aspect of information that seems to be at work in the freedom of information act cases. Assume that an agency agrees with a submitter that documents should be withheld on grounds of trade secrecy. The question for the courts is now whether the documents in fact contain trade secrets. The interesting thing about the litigated cases is that the documents in issue contain information of a type that has never been litigated in a traditional common law trade secrecy case. The cases involve such things as financial
reports on the operation of a government franchise,\textsuperscript{76} manning tables by race and sex submitted to the EEOC,\textsuperscript{77} or lists of consignees on a customs declaration form.\textsuperscript{78}

The explanation for the subject matter of the reverse freedom of information act cases is that they involve documents in which information of value has been assembled in a single place and the criteria of the assembly are clear. The submitter probably would not assemble such a document absent government reporting requirements. And if it did, it would control access to the document and the criteria that led to the assembling of the document would not be clear to a third party who obtained it. In the freedom of information act cases, by contrast, it is clear that the financial report was prepared to meet the requirements of the franchisor and would be of interest to any firm contemplating bidding on the franchise at renewal time; that the manning tables were compiled to meet EEOC requirements and would be of interest to anyone contemplating a discrimination suit against the firm; and that the customs declaration discloses the names of firms interested in purchasing the product exported and would be of interest to firms with the same product for use as a mailing list. Thus the combination of highly specific government reporting requirements combined with the statutory duty to disclose have significantly lowered the cost of obtaining information about competitive firms and reduced the natural tendency of information to protect itself from competitive appropriation.

2. \textit{No One Has an Interest in Stealing Information.}

\begin{itemize}
  \item \textit{(a) High depreciation rate.} Information has a high depreciation rate. My "knowledge" that GoGo Corporation is a great buy today at 45 is not very helpful if the question is whether GoGo Corporation is a great buy 30 days later at 68. Knowledge of markets, product opportunities, or customer needs depreciates rapidly because the actions of competitors affect its value. For instance, the knowledge that it will be profitable to introduce a particular product may become obsolete simply because a competitive firm commits itself to introducing that product. Once that commitment is made, another firm would not also want to introduce the product if the first firm has accurately gauged the size of the market.

  A firm assures rapid depreciation of its valuable information by taking the market actions dictated by the information. If the information is that GoGo Corporation is a good buy at 45, the firm can buy enough GoGo to carry the
\end{itemize}

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  \item \textsuperscript{76} National Parks & Conservation Ass'n v. Morton, 498 F.2d 765 (D.C. Cir. 1974).
  \item \textsuperscript{77} Chrysler Corp. v. Brown, 99 S. Ct. 1705 (1979).
  \item \textsuperscript{78} Twin Coasts Publishing Co. v. Department of Commerce (pending D.D.C.).
\end{itemize}
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price up to 55, where its information indicates GoGo is not a good buy. If the firm's information is that the demand for product R will be down next year, it can reduce its output to the point at which it, and its competitors, have nothing to gain from adjusting further to that information. Thus if a firm has sufficient confidence to rely on some information, it will take actions that cause the information to be worth less.

The explanation for why the courts protect trade secret technology and customer relations information may be that this information has particularly low depreciation rates. The knowledge of how to operate a production line at low cost may be valuable for many years if it is effectively protected from competitors and the competitors do not independently make the same or a different discovery with comparable operating costs. If the characteristics of customers are stable over time, knowledge of those customers will remain valuable for some time. Because of its low depreciation rate, this information may be especially subject to the risk of theft.

A high depreciation rate means that by the time someone steals the information it is worthless, which in turn means there is no incentive to steal it. All a firm needs to do to protect the information is to provide sufficient barriers to make stealing it require some planning and effort.

(b) Markets for stolen information are difficult to organize. The very factors that make information transactions difficult also make it difficult for the thief to market the information effectively. Potential buyers will want assurances that the information offered is reliable and that it is not also being sold to the rest of the industry. "Past, buy my trade secret," says the thief. "Very valuable information which I just stole from Sigma Corporation." "Well," says the buyer, "are you offering me the exclusive opportunity to exploit the information and profit from it?" "Oh yes," says the thief, "I provide a warranty on my stolen information." In one publicized case of systematic trade secret theft, the thieves kept falling out among themselves as one participant in the conspiracy would attempt to sell the information and defraud his coconspirators. In another case, the thief approached Colgate with Proctor and Gamble's marketing strategy for toothpaste. Colgate called in the police and the thief was arrested. Colgate's action may

79 Payne, supra note 22, at 41: "Soon the crack came from within. By the spring of 1961, only six months after the beginning of its successful operations, Fox's group began to disintegrate. Cancelarich and Fine rebelled and accused Fox of holding on to what they claimed was their share of the profits... To try and force his hand Cancelarich and Fine stole his collection of micro-organisms and purloined documents during Fox's absence abroad... Equipped with this material they began their own illicit selling operations..." Harold Farrar was imprisoned for selling Celenas Corporation technology to Mitsubishi Plastics Industries at a price regarded by observers as "an incredible bargain for the Japanese." The price was $77,400 for technology thought to be worth millions of dollars. Wall Street J., Jan. 21, 1980, at 1 c.1.

80 Payne, supra note 22, at 26-27.
not have been entirely altruistic. It would not be unreasonable to calculate that the risks in paying for the information and later finding that it was not authentic\textsuperscript{81} or that it had been sold to a number of other firms in the industry were greater than the gains from helping to destroy the viability of the post-theft market for information. This logic would suggest that the trade secret thief would be well advised to approach firms that themselves do not have valuable trade secrets. But it may be that those firms are not in a position to exploit effectively the information that has been stolen.

(c) \textit{The value of information self-destructs}. A firm with information that its competitors do not possess has an exclusive position to exploit. The only way the information possessed by the departing employee or the information thief can be exploited is in competition with the originating firm. If the information concerns an efficient process, the theft generates two, or more, firms in possession of the process. They may quickly compete away the value of the process. Anticipation of this competition will deter the theft in the first place.

This problem does not apply to thefts by entities that exploit the information in markets where the first firm does not operate. If the firm possessing the secret information cannot operate in certain markets due to tariffs or other barriers, a firm operating within those protected markets can steal the information and benefit from it within the protected markets. There is some indication, for example, that the most serious threat to secret technological information comes from the espionage agents of socialist countries and Japan.\textsuperscript{82}

(d) \textit{Other property rights protect information}. Much information is protected by related property rights that make it worthless to anyone not owning the property. Much information about a manufacturing facility will be of value only to its owner. Much information about a patented technology will be of value only to the owner of the patents.

B. \textit{Firm Organization Substitutes for Contract.} \textsuperscript{83}

A firm is a very efficient form of organization for exploiting confidential information. A few key personnel in the firm can hold and interpret the

\textsuperscript{81} "Colgate wondered whether the supplement was really new." \textit{Id.}


\textsuperscript{83} Benjamin Klein, Robert C. Crawford, & Armen A. Alchian, Vertical Integration, Appropriable Rents, and the Competitive Contracting Process, 21 J. Law & Econ. 297 (1978), develop a theory of vertical integration based upon the problem of opportunistic behavior within contract relations. The ability of employees to appropriate information from the firm is one example of such behavior.
information while controlling, by command, the firm's activities. Limited
dissemination is the first principle of security. Take, for instance, the problem of planning next year's efficient level of output. The managers can direct the steps necessary to act upon the basis of the best estimates of next year's output without providing information about the estimates to the firm's production personnel.

Firm organization can be used to transmit information to firms in an industry. In the oil industry, for instance, firms tend to hire other firms to design and build oil refineries, or to provide geophysical services. The firms that provide these services will do so for all the members of the industry. Their knowledge will itself be proprietary; the contracting firm will benefit from the knowledge, but it will be effectively provided to all the firms in the basic industry involved. All firms can benefit from the design expertise of Universal Oil Products and the well logging know-how of Schlumberger.

Another type of firm that transmits information throughout an industry is the market research firm. This firm proposes to each of the firms in the industry that it will conduct a certain kind of market research and provide the results to each firm at a certain price. It will not conduct the research unless a sufficient number of firms sign up. If they do, the results of the information-gathering project are transmitted to all of the client firms. The market research firm, as the organizer of the activity and the owner of its reputation for accuracy, is able to internalize the benefits of this information-sharing activity.

C. Markets Transmit Information

The finance literature has made it clear that markets transmit information. It can be logical for some investors to decide not to invest in acquiring information about the market but simply to invest in an index portfolio of securities in the market. This strategy works because the market price itself embodies the information necessary to make a rational investment. The same point extends to industrial markets. Take, for instance, the problem of what price a firm should pay for an input. It can either devote resources to studying the market for that input and make decisions about increasing or decreasing its inventory of the input or taking a position in the futures market if it exists, or, conversely, it can decide simply to buy its needs on the spot market or under a market-price-requirements contract. In the first case the firm is deciding to invest in obtaining information about the market and taking actions that affect the market. In the second case the firm has chosen not to invest in information about the market and simply accepts the information embodied in the market price.

Grossman and Stiglitz have developed simple models designed to capture the essence of the process by which markets generate and transmit informa-
tion.84 Their model breaks market participants into two classes. One class is those actors who will invest in obtaining information about the market and take actions to affect the market price. The model does not specify who the firms will be, but a footnote suggests that they will be those with a comparative advantage in obtaining and interpreting relevant information.85 The other part of the market will be those firms who do not invest in acquiring and interpreting the information, but who simply accept the information embodied in the market price. The market transmits the information possessed by the first class of firms to the second class of firms.

In the context of financial markets this analysis is easy enough to understand. One or a few speculators have the ability to first identify, interpret, and act upon the information that becomes available about the value of a security. They do so, thus assuring that the market price embodies the information. To have this effect all they need is access to sufficient capital to move the price of the stock from the erroneous price to the correct one. The other firms will not engage in this activity because their inferior capacity to do it effectively assures that they cannot profit from it. They will accept the market prices as given. The firms providing the information will obtain a return on their expenses plus rents attributable to their comparative advantage in acquiring and interpreting the relevant information.

In the industrial context this model is much more difficult to interpret. The number of important markets in which each firm must operate is large. They include commodity inputs, choices of production technology, labor inputs, and products. An industrial firm is not faced with the single question: is the price of asset \( X \) correct? It is faced with a multitude of interrelated questions. Nevertheless, the model would seem to be equally applicable to this context and is suggestive of a theory of firm structure, particularly a theory which explains why some firms in an industry are large and why some are small, and why some firms would vertically integrate in one way and some firms in another.

The basic idea is that each firm in an industry would specialize in providing information to the market about a particular aspect of the industry's operations. Firms would specialize because they have an advantage in internally exploiting information of value. Firms that exploited information about the basic input costs or output prices of the industry would be rela-


tively large. For instance, in the paper carton industry, large firms would specialize in information about pulp input costs. Small firms would specialize in the needs of particular industries or particular geographic areas. For questions like the appropriate price to pay for paper input, these small firms would simply accept the market input price.

The implications for vertical integration flow from the multiple uses for information once it is produced. Information about the correct price for pulp input to box manufacturers is valuable both to box manufacturers and to producers of the input. A firm specializing in providing that information could increase its return from the information by integrating back into the production of paper pulp. Conversely, a firm that specialized in meeting packaging needs of a particular industry—say, for instance, medicines—might find it profitable to integrate forward into that industry. A firm that is vertically integrated into markets dependent upon the same information can increase its return on that information. The existence of that superior incentive should cause those firms to specialize in the acquisition and provision of that type of information. Simultaneously, the firm would be obtaining other relevant information from the industry markets, information provided by firms that are structured to give them a comparative advantage in the provision of their kinds of information. This process would naturally space firms across the relevant information needs of the industry and reduce wasteful duplication.

Multiple uses for information once produced may be an important aspect of insider trading. If, in making its internal management decisions, a firm must produce information that is also relevant to the prices of its securities, a social loss occurs if that information is not fed to the securities market but must instead be duplicated by outsiders. Henry Manne, in his classic defense of insider trading, began from the view that insider trading is a device for compensating managerial entrepreneurs. That approach is open to the objection that there are numerous other ways to create effective compensation schemes for management, and that the pattern of compensation from insider trading may have little relationship to managerial performance. One standard objection to the argument is that managers can benefit from bad management through insider trading—although if bad management reduces managerial tenure, bad management with insider profits will bring less return than good management with insider profits.

Another approach to insider trading is to start from the premise that if the

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86 Carlton, supra note 84, concludes that a large firm in an industry will have superior planning efficiency as opposed to a fragmented industry structure.


firm has already produced information relevant to the market, an institution should exist that will feed that information to the market. The firm itself could exploit the information in the market for its own securities for the benefit of all continuing shareholders. But if the firm's organization makes it an inefficient user of information in the market, it may be more efficient to let the firm's managers, acting individually—which seems to be the form of firm organization with a comparative advantage in securities markets—provide that information to the market. The existence of this profitable function for management can then be taken into account in structuring the management compensation package.

The theory of modern securities regulation has been to suppress the transmission of this information through insider trading and to make the firm's information available to the market through mandated disclosure of relevant information. The mandated disclosure system is a sometimes comic example of how difficult it is for a central authority to mandate disclosure of the "right" information, and the system has tended to focus on historic accounting costs and to suppress information such as profit projections and other management estimates of economic value. This tendency has been encouraged by the insistence on harsh liabilities for error, making the provision of useful information a risky activity.

Firms have, of course, resisted the disclosure of information that would be particularly valuable to competitors even though the information might be vitally relevant to an investment decision and the statute expressly exempts trade secrets. Therefore firms do not disclose new technologies, potentially important mineral finds, or unexpected profit opportunities until they have captured the value of the information—brought the product to market, tied up the necessary leases, or entered into the new venture. The anti-insider trading policy has focused on these very cases where the management possesses information that the stock market price embodies erroneous information. By barring that source of information to the market, the SEC has made the market less, not more, efficient.89

The sometimes dramatic consequences of the policy are suggested by the Equity Funding case, in which a significant group of insiders were systematically able to sustain the stock market price on the basis of fraudulent transactions.90 One wonders whether, in the absence of the insider trading rules,

89 In these situations, insider trading activity might through its effect on stock price, tip off others to the existence of the secret. Thus firms might wish to bar insider trading in many situations, and some firms might wish to do so at all times. The firm can bar insider trading by contract with its employees, but violations of such contracts would be difficult to detect. The SEC's regulatory apparatus helps firms wishing to suppress insider trading to do so, but leaves firms wishing to permit it unable to do so.

90 Robert N. Loeffler, Report of the Trustee of Equity Funding Corporation of America 6
some member of the inside conspiracy would have yielded to the temptation to benefit by speculating against the certainty of a fall in the stock market price. In that situation the insider trading rules might have made the insider conspiracy more stable by eliminating one profit temptation to defect from the conspiracy. When an outsider became aware of the conspiracy his trading activities hastened its collapse and brought SEC disciplinary sanctions upon him. The effect, of course, was to make the activity of discovering and reporting fraud in publicly traded companies less profitable.

For transmission of market information to work, the relevant market must have sufficient depth and continuity to be efficient. For example, a right or commodity that is traded on average once every decade, or is traded in a way that makes the trading price and terms unverifiable by competitors, will not aid the transmission of information. There is an interdependence between the organization of firms (for instance, their degree of vertical integration) and the organization of markets. Actions by one or more firms that erode the quality of particular markets have an impact on firms who rely on those markets to acquire information. Imagine an industry whose production process consists of four stages, each stage producing an intermediate product. A firm can determine whether its total production process is as efficient as its competitors' from the end-product market price. But the firm can also determine whether each stage is as efficient as its competitors' if a market exists in each of the intermediates.

This line of argument might be used against all vertical integration, including tie-ins, on the ground that the more explicit markets there are the better. The organization and operation of markets require resources, however, and the usefulness of the information generated by a market is influenced by its depth and continuity. A policy that strives to fragment the economy into an infinite number of market interactions would be ironically a policy to destroy all informative markets. 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.

The development of a market in an industry requires that the industry

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(October 31, 1974), concludes that the fraud was essentially a securities fraud whose objective was to inflate the stock price.

91 It was a repeated pattern for employees to discover the ongoing fraud and then to begin their own fraud protected by their ability to blackmail their superiors. See id. at 129-133. This "climate of personal moral decay," id. at 133, increased the financial strain on the conspiracy. None of the employees who discovered parts of the fraud attempted to benefit by selling the stock short.

92 Ray Dirks, a securities analyst, learned of the fraud from Ronald Secrist, a former employee who had also reported the fraud to the insurance regulators. Trading by Dirks's clients had a dramatic impact on price and accelerated collapse of the fraud. Id. at 110-113.
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share conventions about the terms and conditions of trade. This requirement is most visible in organized securities markets with their elaborate requirements on units and time of trade, forms of orders, payment obligations, and so on. This means that it is not costless to change markets, since it will be costly to all of the participants to adjust to new trading terms and procedures.

In organizing its own operations a firm must consider how those operations will relate to existing markets in the industry. Consider, for instance, the problem of choosing between two technologies for producing end product X. One technology involves the production of intermediate products A, B, and C which are widely bought and sold. The other technology involves no such intermediates. The capital risks are equivalent. An advantage of the first technology is that the firm can use the information embodied in the intermediate markets to monitor the efficiency of the process operation and to adjust to changing technologies. If its costs exceed the market price for intermediate A, the firm will know something is wrong in that part of the process. If the firm cannot correct the problem, it will have the option of closing that part of its operation and buying A on the market. Conversely, if its costs of proceeding from C to X exceed the difference between the two market prices, the firm can either correct the cost situation or close that part of its process and sell C instead of X. Thus the first technology is better diversified to face the technological and market risks of the capital investment decision, for it has more of the characteristics of an index fund. Similar problems exist in the human capital field. There is an advantage to a firm in adopting technologies and procedures that utilize standard human skills for which markets exist. If the employees are trained in recognized professions and use widely accepted skills and procedures, then the market will provide information to both the firm and the employee about the employee's wage value. But if the employee is trained in skills specific to the firm, determining wages will be more costly for the firm and the risks associated with the specialized investment will have to be carried by the firm.

These arguments explain why firms might choose to buy production technology from machinery suppliers and designers and to acquire human skills from specialized, independent educational institutions even if they could perform those tasks at lower short-run cost within the firm. It could also explain why employers permit employees to participate in professional conferences or publish articles about their work. A firm wants to be different than its competitors, but not too different. The use of outside designers, equipment suppliers, staff training, professional conferences, and consultants are all ways the firm can assure that its internal operations and technology do not drift away from the industry's norm and impair the firm's ability to use the information content of existing markets.
Not only might this approach illuminate some central problems of industrial organization, such as firm structure of an industry and vertical integration, but it may supply the "missing link" between micro- and macrotheory—why macroevents have observable effects on real instead of only nominal economic variables.\textsuperscript{93} If firms in fact, and quite rationally, acquire most of the information they need from markets, the relative efficiency of their response would depend on the efficiency with which the firm production–market transmission mechanism works. The firm must be able to position itself within the relevant market in a way that enables it to profit from the production and exploitation of the relevant information. The finance literature has verified that some process makes the securities markets efficient in terms of information relating to a particular security. It is easy to conjecture how a firm is able to collect information about such a security and then make the market transactions necessary to capture the value of the information and simultaneously make the market price efficient. But it is very difficult to gain, in proportion to its value, from information that affects every market. This would mean that firms get good information about the relative prices of inputs and outputs, but not as good information from markets about macroevents. A major welfare cost of an unstable price level may be that the price level degrades the quality of the information that can be extracted from markets and thus increases the "errors" of firms dependent on those markets for information vital to their operation. To put the point in terms of the finance literature, today's price contains good information on the relative value of security $X$ against all other traded securities, but it contains much poorer information about the price level of all securities six months from now. Firms would, therefore, consistently underestimate the inflationary or deflationary effects of macroevents, which would lead to the effect of macroevents on real economic variables.

Whether this approach to the problem holds promise of illuminating the sense (if any) of the longstanding legal antipathy to postemployment restrictive covenants remains unclear.\textsuperscript{94} Postemployment restrictive covenants reduce the depth and continuity of the labor market because any transaction requires the assent of three rather than two actors. It is not at all clear, however, why the firms rather than the courts are not in a better position to shape the contractual institution in light of changing industrial realities. One

\textsuperscript{93} Why does not a doubling of the money supply only lead to a doubling of nominal prices? Robert E. Lucas, Jr., An Equilibrium Model of the Business Cycle, 83 J. Pol. Econ. 1113 (1975), develops a model of the business cycle based in part on information derived by agents from the price system. See 1122-23.

\textsuperscript{94} Rubin & Shedd, supra note 6, use opportunist behavior as an explanation. This explanation does not, however, explain why the parties to the contract are not able to provide for or assume that risk. Cf. Anthony T. Kronman & Richard A. Posner, The Economics of Contract Law 225 (1979).
insight may be provided by the persistent similarity the courts see between postemployment restraints and involuntary servitude. At first blush this seems an odd association. The postemployment contractual restraints do not obligate an employee to labor. The connection may be that the law's policy forbidding contracts of slavery and involuntary servitude creates an artificial incentive to use restrictive covenants. Assignable contracts of involuntary servitude, unlike restrictive covenants, do not reduce the depth and continuity of the labor market because the transaction can occur in the form of a sale of the contract from one employer to the other. Human capital is the only important economic asset for which that form of transaction is unavailable. This may in turn create inappropriate incentives to use restrictive covenants, whose effects on the market are an external cost not borne by the contracting parties. The courts then step in to limit these costs external to the transaction by policing the permissible scope of the transaction.

Economists think about markets within an implicit legal framework of property (to provide incentives for the creation of value) and contract (to facilitate exchange of value). That implicit framework does not fit the phenomenon of the production of information by, and the transmission of information between, competitive firms. The argument of this final section is that different institutions—firms and markets—are a more promising implicit framework for analysis of the ways in which competition produces and transmits valuable information.

Posner summarizes this tradition: "For at least a century, economists have been concerned that a purely competitive market would not produce enough information. The underlying problem of information production is the difficulty of appropriating as private profits any of the social benefits that the disseminator of information creates. Unlike most goods, information is not consumed by use. If I, a farmer, sell you an apple, and you eat it, no one else can eat it; thus anyone who wants my apples will have to do business with me and will have to compensate me for my costs in growing them. But if I sell you an idea, and you use it to produce something that reveals the idea, anyone else can use the idea without dealing with me. Of course the law may seek to prevent such appropriation. The point, however, is that some legal intervention or other 'artificial' restriction is necessary to make an idea a saleable commodity." Richard A. Posner Information and Antitrust: Reflections on the Gypsum and Engineers Decisions, 67 Georgetown L.J. 1187, 1193 (1979).