

# International Encyclopedia of the Social & Behavioral Sciences

*Editors-in-Chief*

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emulation by developing nations, albeit with a lag to allow for evolution to do its work. This is even more alluring when to do so happens to foster our national interest in shaping foreign markets in ways that will be congenial to Western capital and our own national firms in particular. To avoid this fallacy, the new law and development should be tentative, situational, and dialogic. We should be careful not to project our own past on others and idealize our own society. We should seek to develop knowledge only in conjunction with those directly affected by our 'science' in a truly transnational environment.

Finally, the academy needs to address the normative vision that guides scholars and activists working on law and development. The law and development movement has multiple and potentially conflicting goals. On the one hand, the promotion of democracy and human rights through legal and judicial reform promises greater access to justice and a means of enforcing accountability and transparency. On the other hand, legal reform efforts aimed at creating a market-friendly environment attractive to foreign and domestic investors (such as the growing attention to alternative dispute resolution mechanisms and the funding of economic legislative drafting) can overshadow or crowd out the social and political dimensions of reform. Even more dangerous is the possibility that market-driven legal reform that benefits an economic elite minority may run counter to democracy-oriented reform goals that are geared towards a politically powerful but impoverished majority, with the resulting potential for ethnic tensions or conflict (Chua 1998). The academic community must always be sensitive to potential conflicts, and ensure that the enterprise promotes fairness as well as efficiency, and democracy as well as markets.

*See also:* Development and the State; Development, Economics of; Development: Social; Development: Social-anthropological Aspects; Human Rights, Anthropology of; Human Rights, History of; Human Rights in Intercultural Discourse: Cultural Concerns; Justice and Law; Law and Democracy

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D. M. Trubek

## Law and Economics

Under the economic approach to the analysis of law, two basic questions about legal rules are addressed: descriptive questions, concerning the effects of legal rules on behavior and outcomes; and evaluative questions, concerning the social desirability of the effects of legal rules. In answering these questions, the method employed is that used in economic analysis generally. Namely, individuals and firms are ordinarily presumed to be forward-looking and rational, and the framework of welfare economics is adopted to assess the social desirability of outcomes. The field of economic analysis of law may be traced significantly to Bentham (1789), but lay essentially dormant until the contributions of Coase (1960), Becker (1968), Calabresi (1970), and Posner (1972). The field is now rapidly growing, although it is far from mature (one indication being lack of empirical work). To illustrate the approach, this article first focuses on accident law, briefly considers other areas of law, and concludes with a section on basic foundations and criticisms of the economic approach.

### 1. Economic Analysis of Law Illustrated: Accident Law

By accident law is meant the law governing liability for accidents, that is, the rules determining when a party who causes an accident must pay for the harm done. Economic analysis of this branch of law centers

on three issues: incentives toward safety; insurance and compensation of accident victims; and litigation-related costs.

### 1.1 Incentives Toward Safety

A major effect of the liability system is that it fosters the taking of precautions against accidents. Suppose that a precaution will lower accident-caused harm for which a party would be liable from \$3,000 to \$2,000, that is, by \$1,000, but costs less than this amount, say \$500. The party would then be likely to take the \$500 precaution, as it would reduce the party's liability expense by \$1,000. Such logic underlies the conclusion that, under many forms of liability, parties will be led to take socially desirable precautions.

An important qualification about the general point that liability creates incentives toward safety applies to accidents caused by firms' products. In particular, a firm's interest in its reputation may lead it to take proper precautions even in the absence of liability. If a firm's water heaters tend to fail and consumers know about this, they will not pay as much for the heaters, and thus the firm will have a motive to reduce the risk of heater failure in order to avoid having to accept a lower price. Note, however, that this argument depends on consumers' obtaining information about product risk.

### 1.2 Insurance and Compensation

The role of insurance in the context of accidents and liability is of substantial importance due to the widespread ownership of insurance. A major form of insurance is liability insurance, which provides coverage against legal liability. Because liability insurers pay for much of the losses for which injurers are found liable, it might initially be thought that liability insurance largely negates the incentives toward safety inherent in liability. However, some such incentives are preserved under liability insurance because insurers often link premiums or conditions of coverage to the adequacy of precautions, raise premiums on the basis of accident history, and offer only partial coverage against liability.

In addition to liability insurance, standard insurance for victims, that is, their (private or public) medical, life, disability, and property insurance, is of significance. The prevalence of victims' insurance limits the need for the liability system as a means of assuring victims compensation for accidents.

### 1.3 Litigation-related Costs

The litigation-related costs of the liability system are the legal fees and associated expenses (including

litigants' time and effort) borne by parties in resolving disputes that arise when harm occurs. Litigation-related costs are high; for every dollar received by a victim, it appears that over a dollar is spent delivering the dollar to the victim.

### 1.4 Evaluation Under the Economic Approach

Under the economic approach, the liability system is considered to be socially worthwhile where its social benefits exceed its litigation-related costs. The social benefits of the liability system do not lie significantly in compensation of victims, because standard forms of insurance for victims are a cheaper means of compensation than the liability system. Rather, the social benefits of the liability system reside largely in its influence on accident rates. If this accident reduction effect is sufficient to outweigh litigation-related costs, the liability system is socially worthwhile. For example, the liability system might be socially worthwhile in the area of industrial pollution—perhaps the desire to avoid liability induces firms to reduce substantially polluting activity. However, the liability system might not be worthwhile in the area of automobile accidents—perhaps the prospect of liability does not affect driving behavior, which is mainly influenced by fear of personal injury in accidents.

### 1.5 Traditional Analysis Contrasted with Economic Analysis

The traditional view of the liability system is that its primary effect, and its major warrant for existence, is the compensation of victims of harm. This view is at odds with the economic view. On one hand, as just emphasized, compensation is to a great extent accomplished by standard forms of insurance; and, because insurance is a less expensive means of compensation than the liability system, it would be economically unwise to employ the liability system for the purpose of achieving compensation. On the other hand, the inducement of safer behavior is usually not paid serious attention under the traditional view of the liability system. Hence, the prescriptions for use of liability under the two views may conflict. Under the economic view, but ordinarily not under the traditional view, the recommendation is that the scope of liability be reduced where liability has little influence on accident frequency, and that the scope of liability be increased where liability would substantially reduce accident frequency.

A second, related aspect of the traditional view is that liability is intended to ensure the attainment of corrective justice in the classic sense that a wrongdoer should be punished by being made to pay the victim for harm done. From the economic perspective, this

conception of the purpose of the liability system is problematic even in a descriptive sense. As stressed above, a party who is found liable usually does not pay a judgment himself but has his liability insurer pay; if there is punishment, it might be that the party is not fully covered or that his liability insurance premiums may rise. Hence, the degree to which a wrongdoer is punished owing to liability is not direct; it is attenuated and translated in character by liability insurance. Additionally, the victim often does not receive the payment made by the liability insurer; rather it is the victim's insurer that frequently obtains the payment (as reimbursement for the payment that the insurer made to the victim earlier). In all, then, the liability system does not achieve corrective justice in the way contemplated by traditional analysts, because they overlook the effects of liability and of victims' insurance.

## 2. Economic Analysis of Other Areas of Law

In this section, the contours of economic analysis of other major areas of law will be indicated.

### 2.1 Property Law

A fundamental topic in economic analysis of property law is the justification for the very existence of property rights. From the economic point of view, these rights are said to exist because they promote incentives to work, to maintain and improve things, and to trade; and, as well, because the rights reduce problems of wasteful and destructive efforts to take things and to prevent takings. Some economic literature traces historical instances of the emergence of property rights (especially in land) and certain recent property rights developments (for example, in the broadcast spectrum) to these social advantages. Property rights are seen as beneficial due to their salutary effects, not to any intrinsic belief that a person should own the fruits of his labor.

Given the general basis for the existence of property rights, many issues pertaining to property law have been addressed from the economic perspective. One concerns acquisition of property rights in things not yet owned, such as fish in the sea and undiscovered mineral deposits. Here, a theme is that the 'finders-keepers' rule has the advantage that it creates incentives to find things. Yet these incentives may be socially excessive: individuals may engage in duplicative activities to find things (a large number of fishermen may compete for fish that a smaller number could easily catch; many parties may drill oil wells, even though a small number of wells would be sufficient to extract the oil from a reservoir). When this is so, it is suggested

that regulation (limiting the catch of fish, 'unitizing' ownership of an oil reservoir) may be desirable to curb the problem of excessive effort.

Another issue of interest concerns external effects associated with the use of property. These 'externalities' may be detrimental, such as pollution or noise creation, or beneficial, such as beautification of land or spraying to kill mosquitoes. Bargaining among affected parties may sometimes resolve externality problems. Suppose that a factory causes annual pollution harm of \$10,000 to its neighbor but can prevent the pollution by installing scrubbers at an annual cost of \$1000. In the absence of legal rules preventing pollution or imposing liability for it, the victim of the pollution might be expected to pay the factory to obtain scrubbers in order to avoid suffering harm. The victim should be willing to pay more than \$1000 (perhaps \$2000) for the factory to obtain scrubbers. Hence, a legal rule requiring the factory to install scrubbers, or a rule imposing liability for harm, may not be needed to achieve the result that the factory obtain scrubbers. The general possibility that externality problems may be avoided through bargaining, and that legal rules may not be necessary for their resolution, is known as the Coase Theorem, and was advanced in Coase (1960). However, much economic writing discusses reasons why bargaining may not cure externality problems: costs of bargaining (especially significant when the number of affected parties is large), breakdowns in negotiation (often arising when one side misgauges the other's situation), victims' lack of knowledge of danger (suppose the pollution is not apparent). Because bargaining will often fail to solve externality problems, attention has been paid to the use of legal rules (particularly liability rules, regulatory requirements, property rights) to accomplish their amelioration.

A very different issue in economic analysis of property law involves public property, which is to say, property like roads and libraries that the government needs to supply because the private sector will not provide them, or not in appropriate quantity. In this connection, the legal system sometimes allows the government to take land through its powers of eminent domain, but requires it to pay compensation for its takings. According to economic analysis, the power of eminent domain may be socially desirable where government would have undue difficulty in making purchases. A standard example is that, in trying to purchase land for a road, government would be likely to be stymied by even a few landowners on the road's planned path (landowners might be tempted to hold out for strategic reasons). The requirement that government compensate for takings cannot be justified as it sometimes is, as an implicit form of insurance against takings; for, in the absence of a compensation requirement, individuals doubtlessly would purchase insurance against takings. A possible advantage of the requirement of compensation for takings is that it may

discourage government from ill-advised takings, though that argument has been criticized.

Another area of property law concerns intellectual property rights: the law of patents, copyright, and trade secrets. The main theme of economic analysis of this body of law is that intellectual property rights have the beneficial effect of spurring innovations, but the detrimental effect associated with high prices and lower than socially desirable sales of goods incorporating the innovations. For example, economic thinking suggests that the copyright doctrine of 'fair use,' permitting for instance limited excerpting from a book for inclusion in teaching materials, might be socially desirable. This excerpting probably does not reduce book sales or the financial motive to author books (indeed, limited excerpting might increase sales of a book because it serves as a form of advertising), whereas the excerpting benefits teaching, because it means that teaching materials can be rapidly assembled without added cost. Most rules of intellectual property law are viewed against the background of their influence on incentives to innovate and on the sale and dissemination of goods embodying innovations.

## 2.2 Contract Law

A primary issue addressed in economic analysis of contract law is that of contract formation. The basic rule of contract formation is that a contract is legally recognized when and only when both sides have given explicit assent, such as by signing a document. This rule is said to be desirable for two reasons. First, it obviously enables parties to make a contract. Second, it protects parties from becoming bound against their wishes due to their having engaged in negotiations; this protection against unwanted obligations is beneficial because, without it, the negotiations that lead to the making of contracts would be inhibited.

Another issue surrounding contract formation concerns legal duties to disclose information. Economic analysis emphasizes that the social desirability of disclosure depends on the situation. For example, disclosure of a material defect (such as a leaky basement) in the home that the owner seeks to sell tends to be beneficial; for if the buyer knows about the defect, he can take steps to avert harm (avoid storing valuables in the basement or repair it). But should an oil company that learns, through costly investigative effort, that oil lies under a parcel of land, be required to disclose this information to the seller of the parcel? Perhaps not: the effect of such a disclosure obligation would be to make oil companies pay substantially more for parcels of land that they learn are promising, and thus to discourage expensive investigation of the location of oil deposits. Note from the foregoing that the economic analysis of legal rules about disclosure obligations concerns their effects on outcomes and

does not derive from a possible moral call to tell the truth.

The most developed aspect of economic analysis of contract law deals with enforcement of contractual agreements. Enforcement is accomplished mainly by requiring parties who commit breach to pay the victims of breach for harm, to pay them 'damages.' One effect of the requirement to pay damages is that it induces contractual performance, which tends to raise the value of contracts to the parties and to society. A less obvious advantage of damage payments is that they constitute an escape hatch that parties can use when contractual performance becomes difficult, for they can breach and pay damages rather than bear very high costs to perform. This escape hatch element of damage payments also raises the value of contracts, as it makes parties more willing to assume contractual obligations. The escape hatch feature of damages for breach is also socially advantageous—it is not socially desirable for parties to perform when the cost of so doing outstrips the benefit to the recipient of performance. These points and others (notably, concerning risk allocation, and incentives to invest) regarding the virtues of payment of damages for breach have been analyzed intensively in the economic literature on contracts.

The orientation of economic analysis of contractual enforcement, through damage payments for breach, is very different from that of traditional legal analysis. Under the latter, damage payments for breach tend not to be regarded as incentives toward performance or as implicit escape hatches. Damage payments are seen primarily as compensation for harm or as proper desert for the wrong of breaking a promise. It should be added that, under the economic view, breach of a contract should not necessarily be identified with breaking a promise. The contracts that are written are not interpreted as detailed promises that parties truly want to be kept, but rather as incomplete promises that are only rough guides for behavior, and that the parties do not want to govern when performance would be very difficult.

Economic analysis of contracts has also been concerned with specific classes of contracts, including principal and agent contracts, insurance contracts, financial contracts, and donative contracts; the literature on some of these contractual contexts is now highly refined.

## 2.3 Litigation

One aspect of the economic analysis of litigation describes the motive to bring suits in terms of the potential plaintiff's costs of suit, the likelihood of success at trial, and the amount that would be obtained in the event of success.

Another element of the analysis of suit concerns the issue of whether the number of suits is socially

excessive (is there a litigation explosion?) or perhaps socially inadequate. In this regard, it is observed that when a person considers suit, he does not factor in, as a cost to himself, the defendant's legal costs or the state's costs. This indicates that plaintiffs' incentives to bring suit may be socially excessive and thus that suit should be curtailed or barred in some domains. Yet a person considering suit will not usually take into account the deterrent value of the suit—the message that suit will send, which will affect the behavior of others in the future—as well as any additional, wider social benefits. This divergence between the private and the social benefits from suit suggests that in some contexts the number of suits brought might be inadequate, and that public promotion of suit might be desirable.

Given that suit has been brought, the question arises whether the parties will settle their dispute or proceed to trial. The thrust of economic analysis of this question is that settlement is likely when the beliefs of the two sides about the trial outcome are similar, but that trial is likely when the plaintiff is much more optimistic than the defendant. For example, suppose that the beliefs of both sides are identical—each thinks the plaintiff would definitely obtain \$100,000 at trial—and that the trial expenses of each would be \$10,000. Then the plaintiff should be willing to accept as little as \$90,000 (that is, \$100,000 minus his litigation costs) in a settlement, and the defendant should be willing to pay as much as \$110,000 (\$100,000 plus his litigation costs). Hence, there should be room for settlement (any amount in between \$90,000 and \$110,000). If, however, the plaintiff's estimate of his winnings is much higher, say \$200,000, than the \$100,000 the defendant expects to pay at trial, the plaintiff would demand at least \$190,000, which exceeds the \$110,000 the defendant would be willing to pay. Accordingly, trial would be likely.

Economic analysis of litigation has also begun to address topics beyond the general ones of the bringing of suits and of settlement decisions. Among the topics considered are disclosure of information before trial, appeal of trial outcomes, class actions, and alternative dispute resolution.

#### 2.4 Law Enforcement and Criminal Law

An additional area of economic analysis concerns public enforcement of law: the use of enforcement agents (such as police, safety inspectors, auditors) to detect violations of law; and the imposition of penalties for violations.

A theme of the literature on law enforcement is that the magnitude of penalties should be inflated from the level that would be appropriate were detection of violations certain. Inflation of penalties is needed to maintain deterrence, in effect to compensate for the possibility that a violator will not be detected. For

example, if a polluting firm that causes harm of \$10,000 is detected only a third of the time, then the fine that is imposed when the firm is detected should be not \$10,000, but this amount multiplied by three, or \$30,000. For, if the fine when the firm is detected is \$30,000, the firm's probability-discounted, or average, fine is one-third of \$30,000, or \$10,000, providing it with incentives not to pollute similar to those that would exist if it paid a certain fine equal to the \$10,000 harm.

Another point of emphasis in enforcement literature is that, because law enforcement is expensive, it will often be desirable for society not to spend so much on enforcement as to detect violations with high probability: it may be best, all things considered, to conserve on enforcement resources even though this means that many violators will escape detection. To combat the problem of inadequate deterrence that might accompany a low level of enforcement, multiplied penalties can be applied, as just discussed. Thus, there is appeal in employing an enforcement strategy that involves significant chances of escaping punishment combined with high levels of penalty. However, a problem with this low probability-high penalty strategy is that high penalties may be infeasible. Monetary penalties cannot exceed the assets of violators, which may be quite modest. Also, jail sentences can only be so long, and sanctions that conflict with retributive justice—sanctions that are out of proportion to the gravity of a bad act—might be resisted by the public.

A further issue examined in the economic literature on enforcement is the socially desirable choice between fines and imprisonment as forms of penalty. Here, it is generally said that fines are preferable to prison sentences, because fines do not themselves deplete social resources (but rather transfer command over resources from violators to the state). Whereas, imprisonment does diminish social resources, for prisons are expensive to operate, deprive individuals of their liberty, and prevent individuals from participating in the labor force. Therefore, the economic prescription is that fines be employed as the form of penalty when possible. But when fines cannot be used to deter, because the appropriate fines exceed the assets of violators (the typical robber could not be deterred by the threat of fines, given his level of assets), imprisonment should frequently be employed as the form of penalty. A closely connected point is that when fines cannot be used to deter, imprisonment may be useful as a penalty not only because it may deter, but also because it will incapacitate, that is, prevent individuals from doing further harm while in prison.

The foregoing conclusions and associated ones have been applied to criminal law. It has been suggested that many of the undesirable acts that are punished under criminal law (robbery, murder, rape) have the feature that civil suit and fines would not suffice to achieve adequate prevention of the acts. Therefore,

imprisonment is often necessary to deter and to incapacitate those who commit the acts. Further, the magnitude of sanctions under criminal law has been related to the likelihood of detection of the acts, among other elements. Additionally, various doctrines of criminal law have been interpreted as desirable from the economic perspective. For example, that the sanction for murder committed in the heat of passion is less than that for premeditated murder is said to be rational: the ability to deter acts carried out in the heat of passion is relatively low, implying that it would be a mistake for society to incur the costs of the higher level of sanctions that are imposed for planned acts for which deterrence is more effective. Economic analysis of criminal law is concerned generally with the efficacy and the social costs of enforcement and the imposition of sanctions, and does not usually view punishment as a means of achieving retributive justice or other ideas of desert.

### 2.5 Additional Areas of Research

Economic analysis has been brought to bear on a host of other areas of law. These include many business-related areas of law, such as corporate law, tax law, antitrust law, and bankruptcy law, as well as, increasingly, diverse other areas, such as family law, anti-discrimination law, and constitutional law. Moreover, economic analysis has addressed questions surrounding the role of legislative bodies in formulating and enacting legal rules and the role of courts and regulatory agencies in applying legal rules.

## 3. Foundations of, and Criticism about, Economic Analysis of Law

Economic analysis of law is premised on the general assumptions of the discipline of economics. These assumptions and their relationship to economic analysis of law in particular are sketched here. Certain commonly encountered criticisms of economic analysis of law are also mentioned.

### 3.1 Basic Assumptions

With regard to prediction of behavior, the usual assumption made in economics is, as noted at the outset, that parties are forward-looking and rational. This assumption is sometimes criticized as unrealistic. However, the assumption is usually made with the understanding that, although it is best for predicting central tendencies in behavior, various psychological and cognitive biases also influence behavior, and that these sometimes should be taken into explicit account. For example, the propensity to underestimate certain classes of risk, and thus for individuals not to take

proper precautions or to insure adequately against them, has been recognized in economic analysis of law.

With regard to the evaluation of outcomes under the economic framework, the well-being or 'utility' of a person is basic. Economists' conception of utility is completely general and reflects not only the material pleasures of life to a person, but also, for example, the influence on his/her happiness of the treatment of others. From the utilities of individuals, a measure of social welfare is constructed, but there is no single, objective measure of social welfare that analysts study. Thus, utilitarianism is just one among a continuum of measures of social welfare that could be examined. The only significant presumption that is ordinarily made is that the measure of social welfare depends exclusively on the utilities of individuals. This assumption is consistent with concerns for equity in the distribution of utility and wealth, and economists have studied the implications of such concerns in depth.

### 3.2 Notions of Fairness and the Law

As has been seen in Sects. 1 and 2, classic notions of fairness, such as corrective and retributive justice, typically are omitted from the evaluation of legal rules under the economic framework, whereas these notions are traditionally viewed as of great significance to the assessment of the law. The essential reason that, under welfare economics, the notions of fairness are not accorded intrinsic importance is the assumption that they do not directly enter into individual's wellbeing. For instance, whether punishment is in proportion to the seriousness of a crime is ordinarily assumed not to affect individuals' utilities *per se*; rather, punishment may affect individuals' wellbeing through its deterrent or incapacitative effects. Because satisfaction of notions of fairness is presumed not to raise individuals' wellbeing in a direct manner, granting these notions independent weight in the evaluation of outcomes would tend to alter social decisions in ways that lower individuals' wellbeing.

Nevertheless, several qualifications to the last paragraph should be made. First, the assumption that notions of fairness do not matter to individuals may not always be apposite: individuals may have tastes for adherence to notions of fairness (individuals might feel happier if punishments fit crimes). To the extent that that is so, satisfaction of a notion of fairness properly enters into individual wellbeing and thus into social welfare, just as satisfaction of a taste for a material good does. (Notice that the importance of notions of fairness as personal tastes, being contingent on what the tastes of individuals happen to be, is different from the intrinsic importance accorded to conceptions of what is fair and right under deontological philosophical views.) Second, notions of fairness tend to have a desirable functional role (punishment only in proportion to the gravity of bad acts tends to dis-



courage bad acts at relatively low social cost). Thus, advancing notions of fairness and inculcating them in the population (perhaps partly through adoption of legal rules that embody them) may serve to promote social welfare.

### 3.3 Income Distributional Equity and the Law

It may have been noted in Sects. 1 and 2 that the income distributional effects of legal rules were not mentioned as relevant to their evaluation under welfare economics, even though, as noted in Sect. 3.1, distributional equity does enter into the assessment of social welfare. The reason that the income distributional effects of legal rules are usually not considered in their evaluation is that economic analysis suggests that the income tax system (combined with income transfer programs) is a better means of achieving distributional objectives than the legal system. The income tax system is overtly redistributive, reaches all individuals, and is relatively cheap to administer. The legal system is not well designed to redistribute: it directly affects only those individuals who are involved in litigation; and even among them, the legal system is difficult to employ to effect redistribution, for a given class of litigants is often comprised of individuals with widely varying incomes (consider the class of victims of automobile accidents). Furthermore, the legal system is a very expensive device for transferring income. Hence, according to economic analysis, the legal system should not be used as a tool to achieve distributional goals, and if legal rules turn out to have undesirable distributional effects, these can be remedied through adjustment of the income tax system.

### 3.4 Economic Explanation of the Law

Finally, a strand of economic analysis should be mentioned claiming that the legal rules that are observed can be explained as those which best advance social welfare. This hypothesis seems attractive at a very gross level of description (for instance, that liability is imposed for causing harm, rather than for doing good, is explainable in the sense that such liability discourages harmful acts); and sometimes the hypothesis is appealing at a fairly detailed level. However, many, if not most, economic analysts hold a nuanced view of the economic rationality of the law, for many legal rules do not have obvious economic rationales, and a number undoubtedly reduce social wellbeing.

*See also:* Criminal Law and Crime Policy; Disability: Sociological Aspects; Income Distribution; Insurance; Insurance and the Law; Intellectual Property: Legal Aspects; Law and Economics: Empirical Dimensions; Legal Insurance; Litigation; Property: Legal Aspects; Property: Legal Aspects of Intergenerational Trans-

mission; Property Rights; Safety, Economics of; Social Insurance: Legal Aspects; War Crimes Tribunals; Social insurance

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S. Shavell

## Law and Economics: Empirical Dimensions

Since the 1960s, economics has extended its reach beyond the marketplace to study new subjects such as the family, education, discrimination, politics, and even the law. Empirical work plays an essential role in this undertaking, both to assess the predictive power of a given economic model with respect to the examined question, and to provide guidance as to how to amend the economic model to improve future analyses. Empirical work has often served as a touchstone for multidisciplinary discourse on law because the social sciences share common statistical methods for evaluating empirical data, and because such work has commonly suggested the utility of amending the neoclassical economic model to address issues studied in other disciplines, including sociology, political science, criminology, and psychology.

A defendant found not guilty by reason of insanity is automatically committed to an insane asylum. Release is dependent on a judicial hearing in the presence of a public prosecutor and on the presentation of a medical expert's report that, in his or her view, the patient no longer constitutes a danger to self or others.

#### 4.2 Israel

The Israeli Penal Law updated in 1983 reads as follows: 'A person shall not bear the criminal responsibility for an act that he has committed if, by reason of a mental illness or defect, he is incapable of choosing between performing the act and refraining from doing so.'

#### 4.3 Kenya

Kenya's standard also reads much like M'Naghten: 'Where an act or omission is charged against a person as an offence, and it is given in evidence in the trial of that person for that offence that he was insane so as not to be responsible for his acts or omissions at the time when the act was done or the omission made, then if it appears to the court before which the person is tried that he did the act or made the omission charged but was insane at the time he did or made it, the court shall make a special finding to the effect that the accused was guilty of the act or omission charged but was insane when he did the act or made the omission.'

If a defendant is found to be insane, the case is reported to the president; the accused is placed in custody—in either a mental hospital or a prison—and remains under the jurisdiction of the court.

#### 4.4 Japan

The Japanese Criminal Code—amended in 1954—states simply: 'An Act of a person of unsound mind is not punishable. Punishment shall be reduced for acts of weak-minded persons.'

#### 4.5 South Korea

The South Korean Criminal Code—amended in 1960—reads as follows: 'A person is not punishable if, because of mental disorder, he is unable to pass rational judgment or to control his will.'

South Korea also allows for diminished responsibility: 'The punishment of a person who, due to a mental disorder, is deficient in the capacity mentioned in the preceding Section, shall be mitigated.'

See also: Crime and Class; Criminal Defenses; Criminal Law and Crime Policy; Deterrence: Legal Perspectives; Expert Testimony; Guilt

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### Law: Economics of its Public Enforcement

In this article we consider the economic theory of the public enforcement of law—the use of public agents (inspectors, tax auditors, police, prosecutors) to detect and to sanction violators of legal rules. Economically-oriented analysis of public law enforcement dates from the eighteenth century contributions of Montesquieu (1748), Beccaria (1767), and, especially, Bentham (1789). Curiously, after Bentham (1789), the subject of enforcement lay essentially dormant in economic scholarship until the late 1960s, when Becker (1968) published a highly influential article that has led to a voluminous literature. In Sects. 1 through 3, we present the basic elements of the theory of public enforcement. Our concern is with the probability of imposition of sanctions, the magnitude and form of sanctions, and the rule of liability. In Sects. 4 through 14 we then examine a variety of extensions of the central theory, including accidental harms, costs of imposing fines, mistake, marginal deterrence, settlement, self-reporting, repeat offenses, and incapacitation. (A more expansive treatment of the subject of this article is contained in Polinsky and Shavell 2000.)

#### 1. The Basic Framework

An individual (or a firm) chooses whether to commit an act that for simplicity is assumed to cause harm with certainty. If he commit the act, he obtains some gain, and also faces the risk of being caught, found liable, and sanctioned. The rule of liability could be either strict—under which he is definitely sanctioned; or fault-based—under which he is sanctioned only if his behavior fell below a fault standard. The sanction

that he suffers could be a monetary fine, a prison term, or a combination of the two.

Whether an individual chooses to commit a harmful act is determined by an expected utility calculation. He will commit the act if that would raise his expected utility, taking into account the gain he would derive and the subsequent probability of being caught and sanctioned. We will usually first examine the assumption that individuals are risk neutral with respect to sanctions, that is, that they treat an uncertain sanction as equivalent to its expected value; but we will also consider alternative assumptions.

Social welfare is presumed to equal the sum of individuals' expected utilities. An individual's expected utility depends on whether he commits a harmful act, on whether he is a victim of someone else's harmful act, and on his tax payment, which will reflect the costs of law enforcement, less any fine revenue collected. If individuals are risk neutral, social welfare can be expressed simply as the gains individuals obtain from committing his acts, less the arms caused, and less the costs of law enforcement.

We assume, as is conventional, that fines are socially costless to employ because they are mere transfers of money, whereas imprisonment involves positive social costs because of the expense associated with the operation of prisons and the disutility due to imprisonment.

The enforcement authority's problem is to maximize social welfare by choosing enforcement expenditures, or, equivalently, a probability of detection, the level of sanctions and their form (a fine, prison term, or combination), and the rule of liability (strict or fault-based).

## 2. Optimal Enforcement Given the Probability of Detection

We consider here optimal enforcement given the assumption that the probability of detection is fixed (the probability will be treated as a policy instrument in the next section). Thus, we ask about the optimal form and level of sanctions under strict and fault-based liability, and about how the two liability rules compare.

### 2.1 Strict Liability

Assume initially that fines are the form of sanction and that individuals are risk neutral. Then the optimal fine is the harm  $h$  divided by the probability of detection  $p$ , that is,  $h/p$ ; for then the expected fine equals the harm (observe that  $p(h/p) = h$ ). If, for example, the harm is \$1,000 and the probability of detection is 25 percent, then the optimal fine is \$4,000, and the expected fine is \$1,000. This fine is optimal because, when the expected fine equals the harm, an individual will commit a

harmful act if, and only if, the gain he would derive from it exceeds the harm he would cause. Essentially this basic formula was noted by Bentham (1789, p. 173) and it has been commented upon by many others since.

If individuals are risk averse with regard to fines, the optimal fine would tend to be lower than in the risk-neutral case for two reasons. First, reducing the fine reduces the bearing of risk by individuals who commit the harmful act. Second, because risk-averse individuals are more easily deterred than risk-neutral individuals, the fine does not need to be as high as before to achieve any desired degree of deterrence.

Next assume that imprisonment is the form of sanction. In this case, there is not a simple formula for the optimal imprisonment term. The optimal term could be such that there is either underdeterrence or overdeterrence, compared to socially ideal behavior. On one hand, a relatively low imprisonment term, implying underdeterrence, might be socially desirable because it means that imprisonment costs are reduced with respect to those individuals who commit harmful acts. On the other hand, a relatively high term, implying overdeterrence, might be socially desirable because it means that imprisonment costs are reduced due to fewer individuals committing harmful acts.

Now consider the combined use of fines and imprisonment. Here, the main point is that fines should be employed to the maximum extent feasible before resort is made to imprisonment. In other words, it is not optimal to impose a positive imprisonment term unless the fine is maximal. (The maximal fine might be interpreted as the wealth of an individual.) The rationale for this conclusion is that fines are socially costless to impose, whereas imprisonment is socially costly, so deterrence should be achieved through the cheaper form of sanction first. This point is noted by Bentham (1789, p. 183) and Becker (1968, p. 193); see also Polinsky and Shavell (1984).

### 2.2 Fault-based Liability

Assume again that fines are the form of liability. Then the same formula for the fine that we said was optimal under strict liability—namely,  $h/p$ , the harm divided by the probability of detection—will lead to compliance with the fault standard (assuming that the fault standard is optimally selected).

If individuals are risk averse, they are deterred more easily than if they are risk neutral, so the fine does not need to be as high to induce compliance with the fault standard. Moreover, assuming that compliance occurs, no one actually is sanctioned because no one is found at fault (provided that there are no mistakes). Thus, fault-based liability has the attractive feature that it can accomplish desired deterrence of harm-creating conduct without imposing risk on risk-averse individuals (Shavell 1982).

Next, consider imprisonment as the sanction; see Shavell (1987a). Here, for essentially the reasons given in the case of fines, any sanction above a threshold level will ensure compliance with the fault standard, and the minimum sanction necessary to induce compliance is higher the lower is the probability of detection. Also (Shavell 1985), fault-based liability can accomplish deterrence without the actual imposition of costly imprisonment sanctions.

Finally, consider the joint use of fines and imprisonment. In this case, it does not matter what the combination of sanctions is, provided that the sanctions achieve compliance with the fault standard.

### 2.3 Comparison of Liability Rules

Because sanctions are not imposed under fault-based liability (in the absence of mistakes), this form of liability has an advantage over strict liability when the sanction is a fine and individuals are risk-averse, or when the sanction is imprisonment. However, fault-based liability is more difficult to administer. Namely, to apply fault-based liability, the enforcement authority must have more information than under strict liability: it must be able to calculate optimal behavior to determine the fault standard and it must ascertain whether the fault standard was met. Under strict liability, the authority need only ascertain harm. (Moreover, for reasons we discuss in Sect. 6 below, strict liability encourages better decisions by injurers regarding their level of participation in harm-creating activities.)

## 3. Optimal Enforcement Including the Probability of Detection

We now consider the optimal system of enforcement when expenditures on enforcement, and hence the probability of detection, are allowed to vary. Consideration of this issue originated with Becker (1968).

### 3.1 Strict Liability

Assume first that the sanction is a fine and that individuals are risk neutral. Then the optimal level of the fine is maximal and the optimal probability is low (in a sense to be described). The basic explanation for this conclusion is that if the fine were not maximal, society could save enforcement costs by simultaneously raising the fine and lowering the probability without affecting the level of deterrence. Suppose, for example, that the fine initially is \$4,000 and that the probability of detection is 25 percent. Now raise the fine to \$10,000, presuming that the maximal fine is at least this high, and lower the probability of detection

to 10 percent. Then the expected fine remains equal to \$1,000, so that deterrence is maintained, but expenditures on enforcement are reduced significantly, implying that social welfare rises. This process can be continued, and social welfare augmented, whenever the fine is below the maximal level  $f_m$ . Becker (1968) suggested this result; Carr-Hill and Stern (1979, pp. 280–309) and Polinsky and Shavell (1979) note it explicitly.

The optimal probability is low in the sense that there is some underdeterrence; that is, the optimal  $p$  is such that the expected fine  $pf_m$  is less than the harm  $h$ . The reason for this result is that if  $pf_m$  equals  $h$ , behavior will be ideal, meaning that the individuals who are just deterred obtain gains essentially equal to the harm. These are the individuals who would be led to commit the harmful act if  $p$  were lowered slightly. Lowering  $p$  will be socially beneficial because these individuals cause no net social losses (their gains essentially equal the harm), but reducing  $p$  saves enforcement costs.

If individuals are risk averse, the optimal fine generally is less than maximal, as first shown in Polinsky and Shavell (1979) (and elaborated upon in Kaplow 1992). This is because the use of a very high fine would impose a substantial risk-bearing cost on individuals who commit the harmful act.

Next, assume that the sanction is imprisonment and that individuals are risk neutral in imprisonment, that is, the disutility of imprisonment is the same for each additional year. Then the optimal imprisonment term is maximal. The reasoning behind this result parallels that used to show that the optimal fine is maximal when individuals are risk neutral in fines. Specifically, if the imprisonment term is raised and the probability of detection lowered so as to keep the expected sanction constant, neither individual behavior nor the costs of imposing imprisonment are affected (by construction, the expected prison term is the same), but enforcement expenditures fall.

Suppose instead that individuals are risk averse in imprisonment. In other words, the disutility of each year of imprisonment grows with the number of years in prison, perhaps because imprisonment becomes increasingly difficult to tolerate. In this case there is a stronger argument for setting the imprisonment sanction maximally than when individuals are risk neutral (Polinsky and Shavell 1999). This is because, when the imprisonment term is raised, the probability of detection can be lowered even more than in the risk-neutral case without reducing deterrence. Thus, not only are there greater savings in enforcement expenditures, but also the social costs of imposing imprisonment sanctions decline because the expected prison term falls.

Last, suppose that individuals are risk preferring in imprisonment, that is, the disutility of each year of imprisonment falls with the number of years in prison. This assumption seems particularly

important: the first years of imprisonment may create special disutility, due to brutalization of the prisoner, or due to the stigma effect of having been imprisoned at all. Additionally, the fact that individuals discount the future disutility of imprisonment makes earlier years of imprisonment more important than later ones. If individuals are risk preferring in imprisonment, the optimal sanction may be less than maximal (Polinsky and Shavell 1999). In particular, the type of argument used above does not necessarily apply. When the sanction is raised, the probability that maintains deterrence cannot be lowered proportionally, implying that the expected prison term rises. Because the resulting increased cost of imposing imprisonment sanctions might exceed the savings in enforcement expenditures from lowering the probability, the optimal prison term might not be maximal.

When the probability of detection is set optimally, together with the imprisonment term, underdeterrence may well result, not only to save enforcement expenditures, but also to reduce the costs of imposing imprisonment sanctions.

### 3.2 Fault-based Liability

The least expensive way to accomplish compliance with the fault standard is to use the highest possible sanction and, given this sanction, the lowest probability of detection that deters individuals who would be at fault. The reason is that, if all individuals who would be at fault are deterred, the only cost incurred is associated with the setting of the probability; this cost is minimized by using the maximal sanction and a correspondingly low probability. This is true regardless of whether the sanction is a fine or imprisonment and regardless of individuals' attitudes toward the risk of fines or of imprisonment.

### 3.3 Comparison of Liability Rules

As we emphasized earlier, under fault-based liability sanctions are not actually imposed (in the absence of mistakes), which often is an advantage over strict liability. However, this advantage of fault-based liability would have to be weighed against the disadvantages of this rule that we mentioned at the end of Sect. 2.

### 4. Accidental Harms

Until now, we have assumed that individuals decide whether or not to commit acts that cause harm with certainty, that is, they decide whether or not to cause intentional harms. In many circumstances, however, harms are accidental—they occur only with a probability. For instance, if a firm stores toxic chemicals in a substandard tank, the firm only creates the probability of a harmful spill.

Essentially all that we have said above applies in a straightforward way when harms are accidental. If parties are risk-neutral, sanctions are monetary, and the expected sanction equals harm, then induced behavior will be socially optimal; further, the optimal magnitude of sanctions is maximal if individuals are risk neutral because this allows enforcement costs to be saved; and so forth.

There is, however, an additional issue that arises when harm is uncertain. A sanction can be imposed either on the basis of the commission of a dangerous act that increases the chance of harm—storing chemicals in a substandard tank—or on the basis of the actual occurrence of harm—only if the tank ruptures. In principle, either approach can achieve optimal deterrence. If liability is based on the dangerous act, the expected fine should equal the expected harm, while if liability is based on actual harm, the expected fine should equal the actual harm.

Several factors are relevant to the choice between act-based and harm-based sanctions (Shavell 1993). First, act-based sanctions need not be as high to accomplish a given level of deterrence (because expected harm is less than actual harm), and thus are more likely to be able to be paid. Second, because act-based sanctions can be lower, they tend to be preferable when parties are risk averse. Third, act-based and harm-based sanctions may differ in the ease with which they can be applied. Act-based sanctions may be simpler to impose (it might be less difficult to determine whether an oil shipper properly maintains its vessels' holding tanks than to detect whether one of the vessels leaked oil into the ocean); or harm-based sanctions may be easier to impose (a driver who causes harm might be caught without difficulty, but not one who speeds). Fourth, it may be hard to calculate the expected harm due to an act, but relatively easy to ascertain the actual harm if it eventuates, thereby favoring harm-based liability.

### 5. Costs of Imposing Fines

Now suppose that there are costs borne by enforcement authorities in imposing fines. Our principal observation is that such costs should raise the level of the fine. To see why, suppose for simplicity that the probability of detection is fixed, that liability is strict, and that individuals are risk neutral. In this setting, recall from Sect. 2 that the optimal fine is  $h/p$ , the harm divided by the probability of detection. Now let there be a public cost  $k$  of imposing a fine. The optimal fine then becomes  $h/p + k$ ; in other words, the cost  $k$  should be added to the fine that would otherwise be desirable (Becker 1968, p. 192, Polinsky and Shavell 1992). The intuition behind this result is that, if an individual commits a harmful act, he causes society to bear not only the immediate harm  $h$ , but also, with probability  $p$ , the cost  $k$  of imposing the fine—that is, his act results in an expected total social cost of  $h + pk$ .

If the fine is  $h/p + k$ , the individual's expected fine is  $p[(h/p) + k] = h + pk$ , leading him to commit the harmful act if and only if his gain exceeds the expected total social cost of the act. Hence, he will behave in a socially appropriate way.

## 6. Level of Activity

We have been assuming that the sole decision that an individual makes is whether to act in a way that causes harm when engaging in some activity. In many contexts, however, an individual also makes a choice about his activity level—that is, whether to engage in that activity, or, more generally, at what level to do so. For example, besides deciding how to behave when driving (whether to exercise care in changing lanes), an individual also chooses how many miles to drive; the number of miles driven is the individual's level of activity.

The socially optimal activity level is such that the individual's marginal utility from engaging in the activity just equals the marginal expected harm caused by the activity. Thus, the optimal number of miles driven is the level at which the marginal utility of driving an extra mile just equals the marginal expected harm per mile driven.

Will parties' choices about their activity levels be socially correct under the two major forms of liability? The answer is that under strict liability, their choices about activity levels will be correct, but under fault-based liability, they generally will participate in activities to a socially excessive extent. Under strict liability, parties will choose the optimal level of activity because they will pay for all harm done. Under fault-based liability, however, parties generally do not pay for the harm they cause because, as we have discussed, they will tend to behave so as not to be found at fault. Consequently, when deciding on their level of activity, they will not take into account the harm that their participation in the activity causes, and therefore they will participate too much.

The interpretation of the preceding points in relation to firms is that under strict liability, the product price will reflect the expected harm caused by production. Hence, the amount purchased, and thus the level of production, will tend to be socially optimal. However, under fault-based liability, the product price will not reflect harm, but only the cost of precautions; thus, the amount sold, and the level of production, will be excessive.

The tendency of parties to choose an excessive level of activity under fault-based liability, but not under strict liability, was first emphasized in Shavell (1980) and Polinsky (1980).

## 7. Mistakes

An individual who should be found liable might mistakenly not be found liable—a Type I error.

Alternatively, an individual who should not be found liable might mistakenly be found liable—a Type II error. For an individual who has been detected, let the probabilities of these errors be  $\varepsilon_1$  and  $\varepsilon_2$ , respectively.

Given the probability of detection  $p$  and the chances of Type I and Type II errors, an individual will commit the wrongful act if and only if his gain  $g$  net of his expected fine if they do commit it exceeds his expected fine if they do not commit it, namely, when  $g - p(1 - \varepsilon_1)f > -p\varepsilon_2f$ , or, equivalently, when  $g > (1 - \varepsilon_1 - \varepsilon_2)pf$ .

The first point to note is that, as emphasized in Png (1986), both types of error reduce deterrence: the term  $(1 - \varepsilon_1 - \varepsilon_2)pf$  is declining in both  $\varepsilon_1$  and  $\varepsilon_2$ . The first type of error diminishes deterrence because it lowers the expected fine if an individual violates the law. The second type of error, mistaken liability, also lowers deterrence because it reduces the difference between the expected fine from violating the law and not violating it—in effect, making a violation less costly to the individual.

Because mistakes dilute deterrence, they tend to reduce social welfare. Specifically, to achieve any level of deterrence, the probability  $p$  must be higher to offset the effect of errors.

If individuals are risk averse, the possibility of mistakes may increase the desirability of lowering the fine because, due to Type II errors, individuals who do not violate the law are subject to the risk of having to pay a fine (Block and Sidak 1980).

When liability is based on fault, an important implication of mistake is that some individuals will bear sanctions even if they comply with the fault standard, tending to make fault-based liability operate like strict liability. Moreover, as stressed by Craswell and Calfee (1986), individuals will often have a motive to take excessive precautions in order to reduce the chance of erroneously being found at fault.

## 8. General Enforcement

In many settings, enforcement may be said to be general in the sense that several different types of violations will be detected by an enforcement agent's activity. For example, a police officer waiting at the roadside may notice a driver who litters as well as one who goes through a red light or who speeds. To investigate such situations, suppose that a single probability of detection applies uniformly to all harmful acts, regardless of the magnitude of the harm.

When enforcement is general in this sense, the optimal sanction rises with the severity of the harm and is maximal only for relatively high harms; this point was first made in Shavell (1991) (Mookherjee and Png 1992 is closely related). Suppose, for example, that liability is strict, the sanction is a fine, and injurers are risk neutral. Let  $f(h)$  be the fine given harm  $h$ .

Then, for any given general probability of detection  $p$ , the optimal fine schedule is  $h/p$ , provided that  $h/p$  is feasible; otherwise the optimal fine is maximal. This schedule is optimal given  $p$  because it implies that the expected fine equals harm, thereby inducing ideal behavior, whenever that is possible. The result that, when enforcement is general, sanctions should rise with the severity of harm up to a maximum also holds if the sanction is imprisonment and if liability is fault-based.

### 9. Marginal Deterrence

In many circumstances, a person may consider which of several harmful acts to commit, for example, whether to release only a small amount of a pollutant into a river or a large amount. In such contexts, the threat of sanctions influences which harmful acts individuals choose to commit. Deterrence of a more harmful act because its sanction exceeds that for a less harmful act is sometimes referred to as marginal deterrence (apparently so named by Stigler 1970).

Other things being equal, as observed by Beccaria (1767, p. 32) and Bentham (1789, p. 171), it is socially desirable that enforcement policy creates marginal deterrence, so that law violators have a reason to moderate the amount of harm they cause. This suggests that sanctions should rise with the magnitude of harm and, therefore, that sanctions generally should not be maximal. Note that marginal deterrence also can be promoted by increasing the probability of detection for more severe harms. For formal analyses of marginal deterrence, see Shavell (1992), Wilde (1992), and Mookherjee and Png (1994).

### 10. Principal-Agent Relationship

Although we have assumed that an injurer is a single actor, injurers often are more appropriately characterized as collective entities, and specifically as a principal and the principal's agent. For example, the principal could be a firm and the agent an employee.

When harm is caused by the agent of a principal, many of our prior conclusions are not fundamentally altered; they simply carry over to the sanctioning of principals. Notably, if a risk-neutral principal faces an expected fine equal to harm done, he will in effect be in the same position vis-à-vis his agent as society is vis-à-vis a single violator of law (see Newman and Wright 1990 on a closely related point). Consequently, the principal will behave socially optimally in controlling his agent, and in particular will contract with him and monitor him in ways that will give the agent socially appropriate incentives to reduce harm (but see Arlen 1994).

The allocation of a financial sanction between the principal and the agent would not matter if, as would

be the natural presumption, the parties can reallocate the sanction through their own contract. The allocation of the sanction would matter, however, if it would allow the parties to reduce their total burden, for example, if the agent is unable to pay a fine because his assets are less than the fine; see Sykes (1981) and Kornhauser (1982). Then, the fine should be imposed on the principal.

The imposition of imprisonment sanctions on agents may be desirable when their assets are less than the harm that they can cause; see Polinsky and Shavell (1993). Because an agent's assets are limited, the principal may be unable to control him adequately through use of contractually determined penalties, which can only be monetary. It may be socially valuable to use the threat of personal criminal liability and a jail sentence to remedy this problem.

### 11. Settlements

We consider here how settlements affect deterrence and the optimal system of public enforcement, and whether settlements are socially desirable.

There are two general reasons why parties might prefer an out-of-court settlement to a trial (see generally Cooter and Rubinfeld 1989, and regarding settlement in a criminal context, see, for example, Reinganum 1988 and Miceli 1996). First, a trial is costly in terms of time and/or money. Second, settlements eliminate the risks inherent in the trial outcome. For these reasons, settlement tends to be socially valuable.

But a complicating factor is that settlements dilute deterrence: for if injurers desire to settle, it must be because the expected disutility of sanctions is lowered for them (see generally Polinsky and Rubinfeld 1988). The state may be able to offset this effect by increasing the level of sanctions; if so, settlements are socially desirable for the reasons mentioned in the previous paragraph.

### 12. Self-reporting

We have assumed that individuals are subject to sanctions only if they are detected by an enforcement agent, but in fact parties sometimes disclose their own violations to enforcement authorities. For example, firms often report violations of environmental and safety regulations. There are two basic reasons why self-reporting is socially advantageous; see Kaplow and Shavell (1994b). First, self-reporting reduces enforcement costs because the enforcement authority does not have to identify and prove who the violator was. Second, self-reporting reduces risk. For example, drivers bear less risk because they know that if they cause an accident, they can report this to the police and suffer a lower and certain sanction, rather than face a substantially higher sanction (for hit-and-run

driving) imposed only with some probability. Self-reporting can be induced by lowering the sanction for individuals who disclose their own infractions. Although this will tend to reduce deterrence, the reward for self-reporting can be made small enough that deterrence is only negligibly reduced.

### 13. Repeat Offenders

In practice, the law often sanctions repeat offenders more severely than first-time offenders. This may be beneficial for two reasons. First, as developed in Polinsky and Shavell (1998), raising the sanction for repeat offenders may create additional deterrence: if getting caught violating the law implies not only an immediate sanction, but also a higher sanction for any future violation, an individual will be more deterred from committing a violation presently. Second, as studied, for example, in Rubinstein (1979) and Polinsky and Rubinfeld (1991), making sanctions depends on offense history and allows society to take advantage of information about the propensity of individuals to commit offenses: individuals with offense histories may be more likely than average to commit future violations, which might make it desirable for purposes of deterrence to impose higher sanctions on them. It also may be desirable to incapacitate such individuals by imprisoning them (see the next section).

### 14. Incapacitation

We have focused on the use of sanctions to reduce harm by deterring individuals from causing harm. However, an entirely different way to reduce harm is by incapacitating individuals so that they cannot cause harm. Imprisonment is the primary incapacitative sanction; on the economic theory of incapacitation, see Shavell (1987b).

If the sole function of sanctions were to incapacitate, the optimal sanction would be determined by comparing the expected harm, net of gains, an offender would cause if not in prison to the private and public costs of imprisonment. Jail should only be used to incapacitate individuals whose net harm is relatively high.

See also: Crime: Sociological Aspects; Crime, Sociology of; Deterrence; Law and Economics; Law, Sociology of; Norms

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## Law Firms

The overwhelming majority of lawyers in private practice in most countries around the world practice alone or in very small and relatively informal groupings (Abel and Lewis 1988-95). Beginning in the 1960s, however, there has been a steady trend for lawyers who represent business interests to practice in larger and more bureaucratically organized law firms. Although lawyers for individuals have also attempted to organize larger firms, these efforts have been largely unsuccessful (Van Hoy 1997). As a result, at the end of the twentieth century the large corporate law firm is the dominant organizational model for private practitioners.

### 1. The Evolution of the Large Law Firm: From Cravathism to Megalawyerism

The American law firm of Cravath, Swaine, and Moore is widely credited with creating the blueprint for the modern large law firm in the first decade of the

twentieth century. The 'Cravath System' consists of four interrelated practices. First, lawyers, typically called 'associates,' are hired directly out of law school, paid a fixed salary, and required to work exclusively for the firm. Second, these new recruits are hired for a probationary period during which they are trained by the senior lawyers in the firm, called 'partners,' to handle matters of increasing responsibility for the firm's clients. Third, at the end of the probationary period, the partners select only the best associates for promotion to partnership, requiring those who are not selected to leave the firm. Finally, partners share in both the firms' profits and management, including, most importantly, the selection of new partners (Swaine 1946).

Firms patterned on the Cravath model grew dramatically in size and geographic scope from 1960 to the end of the twentieth century. In 1960, there were 38 US law firms with more than 50 lawyers, with the largest consisting of 125 attorneys (Smigel 1969). Forty years later, there were 250 law firms in the USA with more than 100 lawyers, with several exceeding 1,000 attorneys (National Law Journal 1999). In 1960, virtually all firms consisted of a single office. By 2000, most large firms had multiple offices, with many practicing in several jurisdictions. In 1960, only a handful of US firms had foreign offices. Forty years later, foreign offices of the top 250 American law firms were located in 72 foreign cities and employed almost 5,000 US and foreign lawyers.

During this same period, 'megafirms' (Galanter and Palay 1991) patterned on the Cravath model began to emerge in the UK, Europe, Asia, and other commercial centers. England was the first to develop comparable firms to those found in the USA (Flood 1989). By the end of the century, these firms were among the largest and most globalized firms in the world. Lawyers in the Netherlands (Blankenburg and Bruinsma 1994), Germany (Gerber 1999), Spain (Stewart 1991), Canada (Arthurs et al. 1988), Australia (Galanter and Palay 1991), China (Alford 1995), and Venezuela (Perez Perdomo 1988) have also developed their own versions of the large law firm. Although the structure and culture of these firms reflect important national and regional differences (Trubek et al. 1994), the Cravath System continues to exert a powerful influence on the development of large law firms around the world. As a result, theories about how US law firms are structured are likely to have important implications for firms in other countries that are patterned on the American model.

### 2. Explaining Law Firm Growth

Theorists offer three related explanations for law firm growth: tournament theory, portfolio theory, and demand theory. Although each theory highlights important truths, none captures the dynamic interaction between markets, institutions, and lawyer

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