

Environmental Law and Economics in U.S. and E.U.: A Common Ground?

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ABSTRACT:

This paper analyses the general framework of the law and economics theory applied to environmental issues. An overview of the law and economics literature is provided focusing, in particular, on the comparison between legal and economic instruments to control environmental risk, and on the implications between ex-ante regulation and ex-post liability. Taking into consideration the differences in the law and economics approach between common and civil law systems, the analysis imparts some motives in order to employ an integrated government choice of enforcement, liability design and regulatory policy. The main conclusion of this survey is that the choice of a regulation framework and a legal framework to implement an environmental policy is a difficult task, which requires structured analysis to model the interactions between governments, firms and regulators.

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1. SOME BASIC CONSIDERATIONS²

Primary objective of this contribution is to discuss the law and economics with respect to environmental regulation. In order to do that, an overview of the literature within the traditional economic analysis of law approach is provided focusing, in particular, on the comparison between legal and economic instruments to control environmental risk. Environmental law and economics deals with, among other topics, “legal” instruments (such as liability rules and the traditional command and control mechanisms like environmental standards and targets) and “economic” instruments (such as taxes and marketable pollution rights). However, this terminological distinction can be misleading in view of the fact that the legal instruments are also economic, in the sense that they provide an incentive to comply with certain policy goals. Likewise, the economic instruments are also legal in the sense that a system of taxes or marketable pollution rights needs a legal framework to be effective (Faure, 1998).

As it is well known, the earliest roots of the law and economics movement have to be found in economists like Adam Smith and Jeremy Bentham, Pigou A.C. (1932) and Ronald Coase (1960), as well as Max Weber (1978). The idea of applying economic concepts to gain a better understanding of law helps either in explaining how legal rules evolve, or what might be the consequences of alternative rules. One of the most controversial principles of law and economics is the so called “efficiency criterion” which emphasizes that the primary objective of a legal system has to be efficiency and that rules have to be evaluated for their capability of supplying incentives for the maximization of the society’s aggregate benefits; in fact, the “wealth maximization” principle proposed by Posner is a mean of applying the efficiency test (Posner 1972, 1983, Landes and Posner, 1987).

It is important to premise that there is a big hiatus in the law and economics movement between United States and Europe, both for methodological aspects and legal frameworks. The major differences between common law and civil law systems can be identified mainly in the systematization of law, the method of judicial construction, and the differences between judge made law and statute law. These issues deserve a specific analysis, but it is not objective of this contribution to deepen the implications deriving from these crucial matters. Just to give some flavor of the importance that these approaches can have in the different legal systems, it is worth noting that 1) systematization of law is alien to common law, which consists of case law, derived from hundreds of thousands of cases (Kerkmeester and Visscher, 2003), that 2) the method of judicial construction in common law systems works case to case, while in civil law systems it works subsuming a concrete case under a general rule, and that 3) common law is dominated by judge made law, while civil law is characterized by statute law. Taking into account these structural differences between common law and civil law, it is not possible to give a general opinion regarding the superiority in efficiency of one system relative to

² I am particularly grateful to Cesare Imbriani that provided the inspiration for this contribution. The responsibility for any errors or omissions remains obviously only mine.

the other. Nor is there reason to assume that one system is better or worse suited for economic analysis than the other.

In any case, it is worth noting that, the law and economic theory, at its first steps, was restricted to antitrust issues and to contract law. Nowadays in the United States, law and economics has led to remarkable and innovative methods for analyzing legal rules in all areas of law, from contract law, tort and property law to commercial law, constitutional law, criminal law and environmental law. Among the several potential definitions for economic analysis of law; one largely accepted is “the application of economic and econometric methods to examine the formation, structure, processes of law and legal institutions” (Rowley, 1989).

The most important characteristic is, however, that “the economic analysis of law is an inter-disciplinary subject, bringing together the tools of two great fields of study. Economics allows us to perceive the legal system in a new way, one that is extremely useful to lawyers and to anyone interested in issues of public policy. If economists will listen to what the law has to teach them, they will find their models being drawn closer to reality” (Cooter & Ulen, 1988).

The present tendency is to subdivide law and economics in two branches of studies (Posner, 1983). The “old” law and economics is interested in studying the legislation regulating the market (i.e. the behavior of individuals and organizations in the market), and dates back to Adam Smith;³ the “new” law and economics is interested in studying the legislation regulating nonmarket behavior (e.g. criminal law and family law), whose objective is to apply “economics to core legal doctrines and subjects such as contract, property, tort and criminal law” (Duxbury, 1995). Ronald Coase and Gary Becker are pioneers of this field of study.⁴

It is important to underline the fact that, this study area is developed in a common law system, the United States, where it has been extremely influential, but it has gained popularity in a number of civil law countries in Europe; due to the increasing process of convergence of the common law and the civil law,⁵ the law and economics approach might be able to bridge the gap between the two different legal systems.

Law and Economics in Italy still requires more theoretical and empirical effort in order to develop a common ground of knowledge with the U.S. law and economics movement. The Italian bibliography on law and economics lists only few contributions by Italian economists⁶ and the wish is that the present situation will change in the near future. In the United States, this field is considered “the single most influential jurisprudential school”.⁷ The reason why economics smoothly expanded into law and has produced significant results can be attributed, mainly, to the combination of two factors; the first one is that economics and law have a high degree of commonality; the second one

³ For an exhaustive history of law and economics movement, see Mackaay E.

⁴ It is often said that we are now in the third generation of law and economics (Dari Mattiacci, 2000). The first generation was the one of the founding fathers, and was dominated mainly by lawyers with some understanding of economics. The second generation was characterized by economists who put more emphasis on mathematics, with a consequent shift towards a dialogue between economists and lawyers. The third generation is the actual generation of young professors and researchers, who have studied both law and economics, and of lawyers and economists who have become able to share issues of mutual interest.

⁵ For a more detailed discussion about the pros and cons of convergence, see Funken K. (2003).

⁶ For an extensive discussion on the different perspectives of legal scholars or lawyers and economists in Italy, see Pardolesi and Bellantuono (1999).

⁷ Remarks of Anthony T. Kronman, The Second Driker Forum for Excellence in the Law, 42 Wayne Law Review 115, 160 (1995).

is that economics offers a solid analytical framework of human behavior that conventional legal studies do not have.⁸

In this work, then, both the two strands of literature, the economic and the legal, are reviewed. In section 2, the main issues arising in environmental law and economics literature are presented. In section 3 and 4, the legal and economic instruments and the different alternatives for controlling environmental risk are discussed. Considering a law and economics approach allows choosing among instruments that have an incentive objective (the efficient deterrence of environmental degradation) and a remedy objective (the efficient clean-up of damages and the proper compensation of victims). The economics literature, on one side, helps understanding how an incentive regulation framework should be designed, while the legal literature, on the other side, analyzes how a system of legal liability can provide compensation to victims, internalizing the social cost of hazardous activities. In section 6 some characteristics of the criminal enforcement of environmental laws are presented, focusing, in particular on the theory of deterrence and the application of criminal sanctions. The differences in the law and economics approach between common and civil law system are outlined in section 7 and some conclusive considerations are proposed.

2. ENVIRONMENTAL LAW AND ECONOMICS ISSUES

Laws and regulations play an increasingly significant role in the determination of particular environmental issues and the development of the appropriate policies, but economics is also very important in order to provide society with the right strategies and instruments according to a sustainable development criterion. As argued by Boyer and Laffont (1999), one advantage of the regulation instrument is that policy makers, using their knowledge of the economy, could choose the more appropriate regulation policy.

It might be difficult to delineate the boundaries of the environmental law and economics literature, since the legal literature, by one side, mainly deals with environmental laws and does not address the issue of controlling environmental risk from an economic perspective (i.e. pollution taxes, tradeable permits); the environmental economics literature, by the other side, analyses the effects of economic instruments to control environmental pollution but the legal instruments (i.e. nuisances, liability law) are not usually considered (Faure, 1998). However, it is essential to mention few of the textbooks on environmental economics, some of which also discuss the relevance of the legal instruments, such as Ackerman et al. (1974), Baumol and Oates (1979), Eide and Van den Bergh (1996), Endres (1985), Field (1994), Kahn (1995), Oates (1996), Pearce and Turner (1990), Portney (1990), Revesz (1997), Richardson, Burrows and Ogus (1982), Tietenberg (1992) and Ward and Duffield (1992).

In the economic literature, the early contributions to the regulation of environmental risks have considered models in which the regulator maximizes a welfare function decreasing with the level of damage and the level of abatement costs. The regulatory policy is typically formulated in a single period and remains in effect afterwards (Roberts, Spence, 1976; Kwerel, 1977, Dasgupta, Hammond and Manskin, 1980, Baron, 1985). More recently the literature presents models that take into account asymmetric information (Laffont, 1995).

⁸ Hsiung Bingyuan, *The Success of Law and Economics: A Methodological Interpretation*, Working Paper, National Taiwan University, 2000.

The law and economics literature has focused mainly upon the role of legal institutions and common law rules in achieving efficiency and distributive goals (Calabresi, 1970; Landes and Posner, 1987; Shavell, 1987), in particular in the area of environmental policy (Polinsky 1980; Landes and Posner, 1984; Tietenberg, 1989; Kornhauser and Revesz, 1994). With this approach, liability has been analyzed in terms both of its capacity to provide (*ex ante*) incentives to avoid environmental damage and of its capacity to guarantee (*ex post*) the proper compensation of victims. The courts are then ultimately responsible for meeting these objectives.

Many studies have addressed the effectiveness of specific environmental regulations, focusing, in particular, on their enforcement. Shavell (1987) stressed that one of the weaknesses of regulation in comparison with tort law is that whereas in tort law a victim will usually have an incentive to sue (if he is injured, the damage is sufficiently large and the injuries can be identified), the effectiveness of environmental regulation will be greatly dependent on the possibilities of enforcement. Enforcement issues have been addressed for example by Hawkins (1984), McKean (1980), Richardson, Ogus and Burrows (1982), Russell, Harrington and Vaughan (1986) and Russell (1990).

The question of what kind of penalties have to be used to deter inefficient emissions has been addressed by Segerson and Tietenberg (1992). They more specifically address the question how an optimal penalty structure can be achieved in case of corporate environmental crime, addressing the question under what kind of circumstances there should be individual or criminal penalties or a combination of both.

The effectiveness of criminal liability for environmental offenses has also been addressed in the many publications in this field of Cohen (1987, 1992a, 1992b). He argues that the magnitude of criminal sanctions should be based on harm, thereby criticizing the current American sentencing guidelines, which hold that the fine should be based on the illegal gain. Furthermore, Cohen argues, as many other authors do, that criminal sanctions are only one part of the total picture, since civil sanctions and private settlements must be taken into account as well. Deterrence of environmental harm has been investigated as well by Epple and Visscher (1984), developing a model to measure the effectiveness of enforcement efforts. Recently Gren and Kaitala (1997) examined the possible gains for the enforcing agency from disseminating information as its skill on detecting and convicting violators.

Another piece of literature aims to understand judicial behavior, by analyzing the incentives faced by judges in their judicial role. Explanation of the behavior of judges is one of the most important but also most difficult problem facing law and economics scholars. This is because judicial opinions are the result of utility maximizing behavior and economists are unable to specify the details of judges' utility functions (Posner, 1994). One of the most discussed issues in the judicial literature is why judges rule the way they do. In the existing empirical literature there is disagreement over the role of discretion and over the extent to which discretion affects criminal justice outcomes (Rubin 1977, Priest 1977, Goodman 1978, Landes and Posner 1979). Discretion is one of the most controversial concepts in criminal justice; the everyday discretionary actions of prosecutors, judges, police officers, among others, ultimately result in either justice or injustice. Evaluating whether discretion is a positive or negative concept and the threshold for discrimination and disparity are just some of the issues that are taken into consideration by the law and economics scholars.

The question of which cases to pursue criminally is left to the discretion of the prosecutor. What showing of intent is necessary in order to classify a case as a criminal one? Environmental criminal cases do not necessarily require that the defendant possess

an intent to commit a crime; a principle of “general intent” is instead applied. Consequently, there is little practical difference between the standard for proving a civil and a criminal violation. The environmental criminal prosecutor, therefore, has enormous discretion.

The remainder of this contribution shows how the basic literature on externalities and how the various instruments to control environmental risk, such as environmental liability, are applied to the pollution problem.

3. “ECONOMIC” VERSUS “LEGAL” INSTRUMENTS

Traditionally environmental damage resulting from production activities are included among cases of market failure essentially because 1) the environment is a “public good” that may not be appropriated and has no market price, and 2) the damage to the environment is a case of “externality”, in that it is a social cost that is not internalized into the accounts of the parties causing it.⁹ Thus a market malfunction does not allow for proper internalization of the damage related to the specific category of accidents that cause harm to the environment. This malfunction and the subsequent inefficiencies result into the need for some sort of regulation (Alberton, 2003).

Much of the environmental law and economics literature deals mainly with the two fundamental questions:

1. What is the optimal level of emissions? and
2. How can the law give incentives to comply with this optimal level?

Environmental law and economics employes the so-called *command and control* regulatory instruments, such as environmental standards and targets, together with other administrative obligations and prohibitions, which are often referred to as legal instruments. The command and control approach is often used in contrast to economic instruments; when economists refer to economic instruments they usually mean incentive-based mechanisms, such as taxes or marketable pollution rights.

To the question “what is the optimal level of pollution”, traditional economists would answer that the right incentives can be given by imposing a tax (Pigouvian tax) on the polluting activity. By equaling the marginal tax rate to the marginal costs caused by the harmful activity the polluting firm would get incentives to reduce pollution in an optimal way. However, Coase, in his seminal article “The Problem of Social Cost”, showed that if transaction costs are zero an optimal allocation of resources will always take place irrespective of the contents of the governing legal rule (Coase, 1960). The main question, therefore, is not how the law should give incentives to induce the firm to reduce emissions, but which of the two actors (firm or victims) should be limited in their activity. The Coase theorem is used as a starting point for discussing the role of environmental law and, more generally, the need for legal instruments to control environmental pollution (Baumol and Oates 1979, Oates 1983). A shortcoming of the Coase theorem is that in real life the situation given in the example of one polluting firm that would affect just one or two victims never happens. Usually there are cases of multiple victims where transaction costs will be very high, Coasian negotiations, thus, will not occur and some intervention of the legal system will then remain necessary to reach an internalization of the externality (Mishan 1971, and Kapp 1970).

⁹ As noted by Cropper and Oates (1992), “the source of basic economic principles of environmental policy is to be found in the theory of externality”.

Baumol and Oates (1971) proposed the use of standards and prices for protection of the environment, but with the standards arises the problem of how to set them efficiently. It is opportune to distinguish between different standards. Economists usually refer to “target standard” or “quality standard”. This standard defines the optimal environmental quality for a certain environmental component and is also referred to as an ambient standard.

A second type of standard often used in environmental policy is the “emission standard” that usually determines the amount and quality of the substances that can be emitted into the environment (the quality and quantities of the emissions are regulated, too). A third category of standard is the “production standards” that regulate, at an early stage of the production process, the firm’s production technology. Besides the importance of property rights in providing protection against environmental pollution, another common-law instrument is liability law. In fact, environmental liability is now used as one of the important legal instruments to deter environmental pollution.

4. ALTERNATIVE APPROACHES TO THE CONTROL OF ENVIRONMENTAL RISK

There are two forms of environmental protection policies: the “command and control” strategy is, as said before, a direct regulation of activities that discharge pollutants, while the “economic incentive” policy encourages polluters to reduce pollution voluntarily by providing economic incentives, such as tax benefits and subsidies. Under the command and control policy, the authority sets specific environmental standards for activities that may cause pollution, and requires polluters to satisfy these standards. Law punishes violators of these standards. The economic incentives employ the market mechanism and aim to reduce environmental pollution through the provision of economic incentives. The authority induces polluters to reduce pollution by imposing specific costs or taxes on activities that generate pollution.¹⁰ The task for public policy is to define an acceptable risk by balancing the costs and benefits of controlling the use of hazardous substances.

Therefore, “if society is to make the most of its scarce resources, it should compare what it receives from pollution control and environmental protection activities with what it gives up by taking resources from other users. It should measure the values of what it gains (the benefits) and what it loses (the costs) in terms of the preferences of those who experience these gains and losses” (Freeman 1997).

Fortunately, a variety of efficient control alternatives exist, at least in principle. In fact, it is important to distinguish between *privately* and *state-initiated* controls, and between *ex ante* and *ex post* control (Shavell 1987). A control is *privately* initiated if it is employed only after victims take some legal action or report their situation to a social authority. *State-initiated* controls are employed by the state at its discretion, regardless of any actions taken by victims. A control is *ex ante* if it is applied before, or at least, independently of the occurrence of harm while *ex post* controls are applied after the fact.

Several legal, administrative, and economic factors suggest that *privately initiated* controls may not be sufficient to ensure that potentially polluting activities are managed non-negligently. First of all because the damages are generally disperse; second, detection

¹⁰ The most widely used form of economic incentives is the Pigouvian tax, in the form of emission charges and pricing that incorporates the cost of items to the environment, tradable emission permits and a deposit-refund system. Emission charges should be calculated on the volume of emission discharged by the pollution source, but it is technically very difficult and requires considerable administrative costs.

and assessment of pollution and its related risks require extensive monitoring, testing, and scientific expertise. Frequently a social authority will be better positioned to conduct proper inquiries about risks and to document the occurrence and source of harm. Once a determination has been made that *state-initiated* control measures will be required, the application of the controls must be addressed. As with *state-* and *privately-initiated* controls, *ex ante* and *ex post approaches* are not mutually exclusive.

In the U.S., the activity of the EPA (Environmental Protection Agency) provides a clear example of *ex ante* regulation by an independent environmental authority. This agency acts through the setting of preventive standards and their enforcement, the performance of inspections and, possibly, of actions brought to the federal courts. With respect to *ex ante* regulation we cannot mention the E.U. experience given that a standard setting system has not been established at a European level and that the European Environmental Agency (EEA) plays only a very limited role.¹¹

At the *ex post* regulatory level, the U.S. experience can be again considered as an example, given that the issue of environmental damage liability has emerged since the early 80's, when the Congress enacted the *Comprehensive Environmental Response, Compensation and Liability Act* (CERCLA) and created a *Superfund* for the quick and effective clean-up of dangerous waste sites.¹² The U.S. liability system for environmental damages considers all operators retroactively, strictly, jointly and severally liable for all damages through a system of extended liability (Boyer and Porrini, 2002).

The U.S. liability system, administered by the courts and governed mainly by state law, played an extensive role in regulating, among other environmental risks, air pollution, water pollution and hazardous waste disposal. It provides a mechanism for compensating victims, property, and health injuries by a strict liability system.¹³

The European Community has been trying for many years to define a common system of assignment of liability for environmental damages. In 1993, the European Commission published the *Green Paper on Remedying Environmental Damage*.¹⁴ The Commission published a detailed environmental liability model for the EC in March 1999 and finally the *White Paper on Environmental Liability* in February 2000.¹⁵ The EC White Paper liability system is similar to the U.S. system because both of them are based on a strict liability regime, but they are also different regarding several aspects. For example, while the CERCLA provisions cover every damage including the damage to natural

¹¹ The European Environment Agency was formally established by EEC Regulation 1210/90 in 1990 (amended by EC Regulation 933/1999 and EC Regulation 1641/2003). The decision to locate in Copenhagen was taken in 1993 and the Agency has been operational since 1994. The European Environment Agency is the leading public body in Europe dedicated to providing timely, targeted, relevant and reliable information to policy making and the public, to support sustainable development and to help achieve significant and measurable improvements in Europe's environment. The EEA mission statement is "to provide decision-makers with the information needed for making sound and effective policies to protect the environment and support sustainable development". The Agency ensures this information is available to the general public through its publications and website (www.eea.eu.int). The EEA does not make or enforce European Union environmental policy or legislation: this is the responsibility of the European Commission and the other EU institutions.

¹² The Superfund enabled the government to begin cleaning-up of priority sites placed on the National Priority List (NPL) with money generated principally by taxes on crude oil, corporate income, petrochemical feedstocks, and motor fuels.

¹³ Beside the tort system, there exist a system of private and public insurance, both for the firms' liability and for the consequences on individual health.

¹⁴ Commission of European Communities, Communication from the Commission of the Council and Parliament: Green Paper on Remedying Environmental Damage, COM (93) 47 final, Brussels, 14 May 1993, OJ 1993 C 149/12.

¹⁵ Commission of European Communities, "White Paper on Environmental Liability", COM (2000), 66 final, Brussels, 9 February, 2000.

resources, the *White Paper* covers only traditional damages, such as personal injury and damage to property. In the U.S. system, the Superfund was created to quickly clean-up the environmental damage, while no such fund is established by the *White Paper*. Differences exist also in the definition of lender liability and financial responsibility.

One of the major differences in environmental law between the E.U. and the U.S.A. can be seen in the area of compliance. The U.S. has mandatory compliance that is strictly enforced by the EPA and the court system. The E.U. has only voluntary compliance because of a lack of a binding enforcement mechanism.

Under the economic theory there are two potential candidates for imposing liability, strict liability and fault-based liability. Arguments for and against fault-based, as opposed to strict liability thresholds are many. Issues along these lines are many and the associated literature is vast. Both strict liability and fault based liability lead to socially desirable levels of care. To efficiently control accident risks, it is necessary to limit the expected damages, allowing society to escape the burden of substantial clean-up costs, while minimizing the total costs of taking care.

Efficient risk control requires that the level of care be chosen such that the marginal costs of care are offset by marginal reductions in expected damages. Therefore, an efficient policy should promote decision-making that weighs the costs of taking care against the reductions of expected damages. Under strict liability, injurers are liable for damages they cause regardless of the level of care they exercise. Injurers will be induced to choose the socially optimal level of care since they know that they will be held liable for any damage caused by their use of pollutants. Under strict liability, the injurer is assumed to pay for all damages suffered by victims, whereas, under negligence, he has to pay for damages only if his level of care is less than the due care level.

Under an economic perspective, in the short run, efficiency can be reached by either making the injurer strictly liable for all damages or imposing a negligence rule under which the injurer would be liable for damages only if he had not met the standard of due care.¹⁶ The negligence rule is efficient, provided that the standard of due care set by the court is the efficient level of care (Segerson 1990). Even from a deterrence efficiency viewpoint there is no difference between strict and fault liability; under either regime, individuals will take care if doing so is cheaper than paying for environmental damages. Whether strict liability produces superior deterrence incentives has not any relevant evidence. Recent empirical evidence suggests that strict liability, in comparison to fault-liability, does not result in less spills; in fact, it may cause more spills than fault liability (Alberini and Austin 1999).

But any attempt to establish the general theoretical superiority, in efficiency terms, of either of the instruments over the other is destined to failure, since there is no compelling case showing the most desirable liability regime. Therefore, political feasibility represents the only factor that could determine the choice of moving toward a strict liability regime. Issues of distributional justice as well as equity should be considered. Policies adopted to control environmental risks cannot be evaluated only on the basis of efficiency criteria. Both approaches, generally, can get adapted for practical and political feasibility, but the conceptual differences remain a primary source of tension between those focused on economic policymaking and those focused on environmental policy-

¹⁶ This symmetry between strict liability and negligence does not hold when the injurer can also modify his activity level in a way that can affect expected damages. Strict liability, on the other hand, would provide an incentive for both increased care and decreased use of pollutants, since either of these would reduce expected damages and thus reduce expected liability. In the long run, only strict liability is efficient since the number of injurers is allowed to vary.

making. Using the considerations outlined above would sensitize an analyst to the wide range of factors that would determine the political feasibility of either a strict liability or a fault-based regime. Liability possesses unique advantages where a regulatory authority will not be expected to have good information about risk or the occurrence of harm, and where the deterrence inherent in liability will not be weakened by injurers' inability to pay for harm or the possibility that they will escape suit (Shavell 1987).

"A complete solution to the problem of the control of risk evidently should involve the joint use of liability and regulation, with the balance between them reflecting the importance of the determinants" (Shavell 1987). Between an *ex post* regulatory system which works throughout the attribution of liability and an *ex ante* regulatory system which works throughout the imposition of standard, there exists a complementarity's and not a substitutability's relationship (Kolstad, Ulen & Johnson 1990).

5. CRIMINAL ENFORCEMENT OF ENVIRONMENTAL LAWS

The debate over the use of criminal sanctions in environmental enforcement actions is more intense now than ever. In particular, at the center of public attention is the question, as to whether environmental criminals should be sentenced to prison? Should they be treated as other criminals? Is it justice the evidence of cases in which individual offenders received a jail time sentence, and cases in which for some egregious violations that caused significant environmental harms, only a mere monetary sanction was imposed?

The frequency and intensity of criminal enforcement have increased dramatically in recent years. In spite of the fact that the number of criminal environmental cases is still small when compared to the impressive rise in the number of civil enforcement cases, the criminal cases have been receiving increased attention. Today, it is possible to identify situations that five years ago would not have been viewed as criminal, being looked at for possible prosecution. The debate over what role criminal sanctions should play in environmental regulation and enforcement began in the early 1970s but no clear agreement emerged. Numerous good reasons were emphasized in favor of a minimal role for criminal enforcement. It was argued, for example, that the use of criminal sanctions in the environmental framework was generally not appropriate, and diminished agency resources without an equivalent benefit.¹⁷ Various reasons were given for the inefficacy of criminal sanctions. Criminal proceedings were viewed as more complex than administrative or civil proceedings, and not really appropriate for enforcement of regulatory provisions. Despite diverse impediments, the federal government initiated to prosecute criminally in the early 1970s for water pollution using the provisions of the Refuse Act of 1899 (Kovel 1969).

Public enforcement of environmental laws has been characterized by the increased use of criminal sanctions over the past decade. In the United States, this sanctioning trend has developed in direct response to the passage of the Sentencing Reform Act (SRA), which dramatically altered federal criminal sentencing for the express purpose of controlling judicial discretion. New sentencing guidelines were established in 1987 under which courts were required to impose sentences which reflect the seriousness of the offense, provide just punishment for the offense, and afford adequate deterrence to criminal conduct. Judges were once free to impose any sentence from probation to the statutory maximum and were not subject to appellate review regarding the length of that

¹⁷ See Kovel, A Case for Civil Penalties: Air Pollution Control, 46 Journal of Urban Law, p. 153, 1969.

sentence. However, they are now bound by the sentencing guidelines and subject to appellate review of the sentences they impose. Criminal penalties for environmental violations can be harsh. Maximum fines for criminal violations of environmental statutes theoretically can reach \$1 million per violation. Convicted individuals can face up to 15 years of imprisonment.

In Europe, after the Council drafted a convention on the protection of the environment through criminal law, more importance has been given to the aspects of control and enforcement in the field of criminal law. It is important to mention the proposal for a recommendation of the Council concerning minimum criteria for environmental inspections in the member states, but more importantly there have been various initiatives recently to harmonize environmental criminal law as well. The most important one is definitely a proposal for a directive on the protection of the environment through criminal law (COM (2001), 139) by the Commission. This proposal states that the proposed directive wishes to ensure a more effective application of community law on the protection of the environment by establishing throughout the community a minimum set of environmental offences. The underlying idea is that the member states should ensure that when certain offences constitute a breach of the environmental rules, a criminal enforcement should take place. The need to introduce criminal sanctions comes from the fact that now this type of measures seems adequate to achieve proper implementation of environmental law. Consequently, the correct sentencing approach requires a strong emphasis on how discretion should be exercised in order to treat equally similar environmental violations and to achieve a uniform and coherent sentencing policy. The requirements of deterrence, rehabilitation, punishment and restorative justice, do not generally point in the same direction and that is why the sentencing task is such a complex process characterized by overlapping, and sometimes, contradictory objectives.

In the American experience of *ex ante* regulation, the Environmental Protection Agency's activity represents an example of regulation by an independent authority. Throughout the establishment of environmental standard, the imposition of emission limits, inspections and legal actions, the EPA accomplishes its main tasks. Starting from the '70s, in the U.S. have been employed different approaches to face the risk of environmental accidents, trying to regulate the emission of toxic or hazardous substances by setting up standards. As regards to *ex post* regulation, the Congress in 1980 promulgated the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) to provide the decontamination of sites exposed to environmental dangers through a system of attribution of liability on an objective basis, following the "polluter pays principle".

In Europe, the different regulatory systems and the extreme fragmentation in each member state does not allow to talk in a homogeneous and single way. At the *ex ante*: regulatory level, there exists the *European Environmental Agency* (EEA) but it plays a very limited role. At the *ex post* regulatory level only recently (2000) the European Commission adopted the White Paper on Environmental Liability, which explores how the polluter pays principle, can best be applied to serve the aims of the Community environmental policy. According to the White Paper, the most appropriate option would be a framework directive providing for strict liability for damage caused by EC-regulated dangerous activities, with defenses, covering both traditional and environmental damage, and fault-based liability for damage to biodiversity caused by non-dangerous activities. The adoption of a proposal for a Directive on environmental liability (2002)¹⁸ aims both

¹⁸ For the full text of the proposal, see http://europa.eu.int/eur-lex/en/com/pdf/2002/en_502PC0017.pdf

to prevent and restore environmental damage. The pollution of water, damage to biodiversity and land contamination which causes serious harm to human health would all be covered by this Directive. Operators of certain risky or potentially risky activities who cause environmental damage would be held responsible for restoring the damage caused, or made to pay for the restoration. All operators causing damage to biodiversity, by fault or negligence, would equally have an obligation to restore the damage. The idea that the polluter must pay is a cornerstone of EU policy; this is the first concrete step towards establishing a comprehensive European environmental liability regime.

6. DIFFERENCES IN ENVIRONMENTAL CRIME PROSECUTION PATTERNS IN EUROPE AND UNITED STATES

U.S. environmental policy has developed during the last 30 years and can be considered one of the most successful models that provide a well-balanced environmental management system, an effective legislative framework and modern institutional settings.¹⁹ The U.S. has pioneered environmental legislation that has inspired the EU. Also Europe, over the past 30 years, has developed a considerable body of environmental laws and has enforced environmental crime laws with varying degree of intensity. The big challenge, within the European Union, is to make enforcement effective at both the national and the EU level. Moreover, the upcoming accession means that 10 new member states must also implement EU legislation.

In Europe it is possible to observe a certain degree of reluctance to pursue a company or individual under criminal law. There are few cases brought, particularly in relation to the population and number of companies. The ratio is higher in the U.S., where after two warnings, and if there is insufficient compliance, automatically a civil case is initiated; if some knowing intent or fraud is found, then, the individual or company is pursued under criminal law. In the last decade, in the U.S. there has been a dramatic increase in the number of prosecutions, convictions, criminal fines and jail time and the EPA is continuing to expand its criminal enforcement effort. In understanding why criminal prosecutions in Europe are less frequent and in analyzing the differences in enforcement strategies in the U.S. and Europe, several considerations have to be made. First of all, probably the public opinion regarding the criminalization of pollution and the public desire for prosecutions is different in the two countries. Then, instead of employing criminal sanctions, Europe has preferred to use administrative and civil enforcement, more flexible than a lengthy criminal trial, to ensure regulatory compliance by its industries. Thus, criminal enforcement has not been as necessary in Europe where the principal methods of inducing compliance with environmental regulations have been civil remedies. Civil enforcement, however, generally has focused on achieving compliance with emission standards and criminal enforcement is still needed to deter violations by companies that handle environmentally harmful substances.

These issues and the profound historical differences between the regulatory systems of the United States and Europe have played an important role in the different patterns of environmental crime prosecutions. One of the most important differences between the environmental crime enforcement consists in their integration into the

¹⁹ In the U.S. during the 60-70s, the environmental legislation has been developed mostly at the states level, then, in the 70-80s there was a period of the federal environmental policy development. Since the 90s, there is a decentralization phase that is remarkable with reducing of federal program financing and development of state and local initiatives.

traditional criminal justice system of the respective countries. Environmental criminal enforcement in Europe is managed largely by police officers who report and investigate reported crimes, and by local prosecutors who bring criminal charges against violators. In the United States, the investigation of most environmental crimes is handled by federal authorities and not by local police,²⁰ and is prosecuted at the federal level by the Department of Justice and the United States Attorney's Offices. A variety of factors, therefore, can contribute to explain this divergence in enforcement strategy, including cultural differences, different organizational structures, the timing of major pollution accidents, and different regulatory approaches related to the essence of common law and civil law systems.

A longstanding debate focuses on the best way to achieve compliance with the many complex provisions of environmental statutes and regulations. Is it the EPA's effort necessary to assure national enforcement or the single states could lead to the same level of compliance? Moreover, the Agency is characterized by a surprising degree of regulatory discretion (whether to initiate a hazardous waste inspection, for example, or whether to proceed criminally or civilly; whether to bring an enforcement action administratively or in federal court; whether to impose a high monetary penalty or to accept a defendant's performance of an environmentally beneficial project) and is relatively unsupervised in its exercise (Susskind and Secunda, 1999).

This dispute deals with, among others, the issue on the efficacy of national and local environmental enforcement. On one hand, the federal government's criminal environmental enforcement programs have been accused of inconsistency and lack of policy coordination (Starr, 1991; Gaynor and Bartman, 1991), but on the other hand, local governments may lack the political will to pursue environmental violators with persistence and may prove inappropriate (Mintz, 1991). The efficiency of the EPA's enforcement efforts has varied significantly over the course of the Agency's history. This variability has been mostly explained by the different political parties that have prevailed in its administration and by the different management styles of EPA's top managers (Mintz, 1988).

In Europe, an example of success of local environmental enforcement is represented by the Netherlands (Paddock, 1991). The Netherlands is a much smaller and much more homogeneous nation than the United States, but it is a model of how local regulatory agencies, local law enforcement officers and local prosecutors may well play a useful role in improving enforcement and environmental compliance. "Localization" of environmental enforcement authority could, therefore, bring benefits, but, nowadays in the United States, while some local governments could be able, in practice, to increase their responsibility for enforcement programs, others are not yet prepared and some may never be.

Recently, Europe has been overwhelmed by large oil spills and illegal industrial waste dumping, many of which were caused by intentional or negligent conducts and were, thus, avoidable. In order to deter these sources of pollution, Europe throughout the stronger deterrent effect on potential polluters deriving from large fines, public stigma and incarceration could enhance its criminal enforcement program and strengthen deterrence of preventable acts of pollution.

One of the main differences between the U.S. and the E.U. has to be found, as said before, in the enforcement system of environmental laws. While the U.S. provides for

²⁰ The federal government has a specialized group of environmental crime investigators in the EPA's Office of Criminal Enforcement. These investigators are sometimes assisted by the Federal Bureau of Investigation ("FBI")

action to enforce the law in court, including the imposition of severe penalties, Europe has less of a legal framework to ensure compliance. It is important to underline, therefore, the fact that a common environmental policy is vital for the E.U. because environmental problems are often transboundary and also because the internal market requires homogenous environmental standards.

The main conclusion of this survey is that the choice of a regulation framework and a legal framework to implement an environmental policy is a difficult task, which requires structured analysis to model the interactions between different decision makers, such as governments, firms and regulators. It is essential, then, to combine the economic literature and the legal literature under one comprehensive framework in order to take into consideration, in a social welfare perspective, among others, the social value of environmentally risky activities, the cost of care, the asymmetric information of the different actors and the liability system efficiency.

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