INTERNATIONAL CENTRE FOR ECONOMIC RESEARCH
ICER

WORKING PAPER SERIES

G. B. Ramello

AGGREGATE LITIGATION AND REGULATORY INNOVATION: ANOTHER VIEW OF JUDICIAL EFFICIENCY

Working Paper No. 24/2011

.

Aggregate Litigation and Regulatory Innovation: Another View of Judicial Efficiency

Giovanni B. Ramello*

Università del Piemonte Orientale & ICER

December 2011

Abstract: In this article, we argue that aggregate litigation and the court system can not only restore the protection of victims and the production of deterrence, but also play a pivotal role in stimulating regulatory innovation. This is accomplished through a reward system that seems largely to mimic the institutional devices used in other domains, such as intellectual property rights, by defining a proper set of incentives. Precisely the described solution relies on creating a specific economic framework able to foster economies of scale and grant a valuable property right over a specific litigation to an entrepreneurial individual, who in exchange provides the venture capital needed for the legal action, and produces inputs and focal points for amending regulations. In this light, aggregate litigation thus can be equally seen as an incubator for regulation.

Keywords: aggregate litigation, efficiency, market for risk, hierarchy, regulation, innovation, asbestos
JEL Classifications: K41, O31, G32, L23,

* The author is grateful to participants to Max Planck Institute Jena, and Standards and Conflict Resolution CesIFO Dresden seminars, to the IEL Institutions Economics and Law International Programme conference on "Efficiency and the Judiciary" and especially to Alberto Cassone, Enrico Colombatto, Ted Eisenberg, Manfred Holler, Roberto Ippoliti, Geoffrey Miller, & Bernd Schaefer for the helpful comments and suggestions. The usual disclaimer applies.
Contacts: Department of Public Policy & Public Choice, POLIS, Universita` del Piemonte Orientale, via Cavour, 84, 15100 Alessandria, Italy - e-mail: giovanni.ramello@sp.unipmn.it

1. Introduction

In 1961, Guido Calabresi's influential contribution, "Some Thoughts on Risk Distribution and the Law of Tort", challenged the then-prevailing assumption that spreading losses was more efficient than concentrating them only because "the real burden of a loss is smaller the more people share it" (p. 517).

Just a few years later another seminal work, *The Logic of Collective Action* by Mancur Olson (1965), provided evidence that the uncoordinated action of individuals can sometimes be less efficient than coordinated action. Olson's contribution then became a prominent explanation for the formation of groups and, by extension, the emergence of specific institutions whose purpose it is to make that coordination possible.

Though the above two works were unrelated, they are the two pillars which explain the emergence of aggregate litigation in legal procedure, and the reasons why it can be a powerful device for promoting social welfare when other institutional arrangements seem to be ineffective[1]. There are in fact many circumstances where torts systematically spread losses across multiple individuals, but which individual action through the courts seems ill-equipped to tackle. This has become a major spur for amending regulation: to provide an alternative that complements or fully replaces legal action, in serving the interests of a multitude of interested parties (Glaeser & Shleifer, 2003).

However, there are various cases in which even regulation falls short, and substantial failures emerge with respect to minimising the social cost of accidents, but with much more far-reaching repercussions, for example impacting on the performance of the economic system as a whole (Porrini & Ramello, 2011).

The above two shortcomings have resulted in a systematic under-protection of victims in some jurisdictions, prompting national lawmakers to address the incompleteness of liability systems.

Aggregate litigation offers a reasonable solution midway between individual litigation and regulation, by creating a mechanism for gathering dispersed victims and channelling them into a type of action where the various parties jointly seek to promote their individual interests and those of society at large.

Though arguments can be made both in favour of and against aggregate litigation, multi-claimant disputes, resolved and litigated on a collective basis, thus far seem to be the most efficient

[1] The term "aggregate litigation" is used here to denote lawsuits that bundle together large numbers of similar claims (hundreds, thousands, or more) pursued in some collective manner, i.e. what it is sometimes termed "group litigation". The most well-known such procedural device--though not the only one--is class action. For a discussion see Hensler (2001).

institutional solution for protecting victims and society, to the point that some authors have even posited an “inevitability” of aggregate litigation (Erichson, 2005).

The aim of this work is to discuss one particular—often overlooked--argument in favour of aggregate litigation, as way in which liability can further serve society: it can contribute significantly to regulatory innovation, by producing a set of outputs that, taken together, supply focal points and inputs to the regulatory rule-making process, which is in many cases fossilised by structural rigidity. In this respect, therefore, aggregate litigation can help avert future regulatory failures. It can thus be regarded as an alternative judicial market technology that transforms the lawsuit into a "regulation incubator"--a field experiment for ascertaining the necessity of change, and the ability of the proposed solutions to meet real-world needs, also thanks to the large number of plaintiffs who become a proxy for society.

Viewed in this light, aggregate litigation also pursues the goal of dynamic efficiency, by providing incentives that foster innovation, similarly to what happens, for example, with intellectual property rights.

The article is organised as follows: section 2 uses the asbestos saga as an example of how aggregate litigation can promote regulatory change, while section 3 further examines the nature and limitations of regulation and its rule-making process; section 4 considers the different relationships that exist between regulation and litigation, discussing how aggregate litigation can become instrumental to regulatory innovation; section 5 sketches out the rationale of aggregate litigation, discussing how this procedural solution is becoming significant in the tort system, while section 6 disentangles the workings of the reward system set up by aggregate litigation, to determine the conditions under which this solution is superior to the alternatives for fostering innovation (but also for protecting victims); finally, section 7 draws the conclusions.

2. A historical tale: the long and winding road of asbestos regulation

The story of asbestos--with particular focus on the US—provides an interesting example of the role of aggregate litigation in imparting momentum to regulatory change.

Archaeological digs in Scandinavia have shown that, as early as 5000 years ago, asbestos was being used in crockery for its fire resistance properties. Subsequent history evinces an almost sacral respect for this ‘indestructible' (this is the meaning of the Greek word “asbestos”) mineral fibre and its widespread use in many cultures for a variety of purposes (e. g. fireproofing, insulation, etc.). However, almost from the earliest times, we find suspicions of a link between asbestos and health

problems. The first-century geographer Strabo noted that workers exposed to asbestos experienced diseases, while Pliny the Elder advised against purchasing slaves from asbestos mines because "they die young" (Barbalace, 2004a).

Still, nothing substantial happened in the centuries that followed to reduce asbestos use, which on the contrary saw a dramatic rise during the industrial revolution. Since then, and for much of the 20th century, asbestos was extensively employed for building ships, water pipes, clothing, hair dryers, children's toys, and many other consumer and construction products.

During those years, use of asbestos continued even as more definitive proofs began to emerge that asbestos exposure caused a number of serious diseases, including mesothelioma (cancer of the pleural lining of the chest and abdomen), lung cancer, gastrointestinal cancer and asbestosis (a disease affecting the breathing capacity of the lungs, which can range from non-disabling to fatal).

First of all, there was no shortage of market signals, if we consider that by 1918 life insurance companies started to charge higher premiums for asbestos workers.

Scientific evidence also began to abound during those years: in 1924, Dr. Cooke, an English pathologist, published a number of reports identifying asbestos as the cause of various diseases. These prompted a public investigation and calls for improved regulation, but led to no severe penalties for asbestos use (Barbalace, 2004a and 2004b).

Almost at the same time, a number of lawsuits were filed by asbestos workers. The first known U.S. compensation claim for asbestos disease was in 1927, and during the 1930s many other individual actions were filed.

Notwithstanding all these developments, and the scientific recognition of the dangers of asbestos, regulatory agencies failed to take their cue and amend the system, while tort law on its own was unable to impart the momentum for serious change (White, 2004).

During that period, some states set up workers' compensation programs that paradoxically acted as a safe harbour for producers against subsequent liability. Apart from that, for a long time regulators were essentially asleep at the wheel, and asbestos use continued to increase unhindered in the US and many other countries over the decades. In spite of mounting evidence that asbestos exposure posed serious health risks, in the US--the pioneering nation for regulatory change--asbestos use continued to grow up until the early 1970s, and it was only then that regulatory agencies–the Environmental Protection Agency (EPA), the Occupational Safety and Health Administration and, later, the Consumer Safety Product Commission—began to seriously take note and amend the restrictions. Increasingly stringent regulations were then put in place over the ensuing years, culminating in the total ban proposed by the EPA in 1989. Though this ban was later overturned by

a federal circuit court[2], allowing some products to still legally contain trace amounts of asbestos, by 1990 overall asbestos use had become tightly controlled, and in most products it could no longer be used[3].

Now, the main reason advanced to explain this regulatory shift is that the liability environment became less favourable to asbestos producers during the 1960s. This was due to various factors, including the transition of product liability law from a negligence rule to a strict liability rule, the mounting scientific evidence, and some changes to the legal technicalities of lawsuit claims, not the least of which was the newly introduced possibility of filing aggregate lawsuits–in general under Rule 42a, available since 1966–and the resultant awarding of compensation to victims (Hensler, 2001; White, 2004).

The turning point occurred in 1969, with the compensation paid by the largest U.S. asbestos producer to 285 of its employees, who were able to access a consolidated litigation. After that, many other aggregate litigations were filed that resulted in the victims receiving compensation (Carroll, et al., 2005).This seems to have had a significant effect in attracting the attention of regulators and triggering regulatory change. The consequences extended beyond the borders of the US, with other countries implementing similar regulatory regimes in their own national systems.

It is worth noting that this pattern of causal links between aggregate litigation and regulatory change has also occurred in other situations. For instance, a comparable sequence of events unfolded in the case of breasts implants, which "demonstrates how manufacturers control the flow of information and how [aggregate] litigation can provide information that stimulates regulation" (Hersch, 2002, pp. 143-144)[4]. In this case, too, there was the recognition of a previous regulatory failure by the Food and Drug Administration, which was then put on the right track for correcting the regulations by the litigation and the information thereby disclosed.

If we consider these two cases, certain similarities emerge that are relevant to the thesis under discussion:

1. Regulation can for a long time prove ineffective due to capture by producers, or simply due to the inertia of the pre-existing regulatory equilibrium.
2. Aggregate litigation can act as a trigger for regulatory innovation: whereas separate individual lawsuits seem unable to make their impact felt on the rule-making process,

[2] Corrosion Proof Fittings v. EPA, 947 F.2d 1201 (5th Cir. 1991).

[3] The described dynamic also had consequences in other countries, which at the turn of the century completely banned the use of asbestos; this naturally entailed further restrictions on US productions that were partly intended for export.

[4] An interesting observation is that, also in this case, there were individual litigations that awarded damages to the plaintiffs. However regulation only received a significant push with the launch of the first class action, in which over 440,000 women took part (Hersch, 2002).

aggregate litigation instead seems to attain a sort of minimum efficient scale in liability, able to elicit a reaction from regulators.

3. The outcome(s) of the legal action can then serve as the inputs for the ensuing regulatory change.

To summarise, aggregation is a litigation technology that, as well as possibly permiting more efficient vindication of claims regarding “a common question of law or fact”, also creates a proper set of incentives for fostering innovation in regulation. However this second effect, as we shall argue below, is strictly dependent on the existence of sufficient private incentives for undertaking the legal action.

3. Structural characteristics and limits of regulation

Regulation is a centralised system, external to the market, which has the aim of pursuing socially beneficial objectives that often include, among others, efficiency. This function, paired with the desire to protect the "public interest", has led to the emergence of a "regulatory state", intended to correct real or presumed market failures for which a public solution seems called for. A typical case is the need to remedy failures arising from natural monopolies, but also those connected with various types of externalities and information asymmetries, which have the well-known effect of distorting the efficient allocation of resources.

In some cases—relevant also to the discussion that follows—a further aim of regulation is to promote the production of public goods which the market is unable to produce on its own account.

From a structural standpoint, the advent of regulation means that decisions and choices become centrally managed by government bodies, generally under a "command and control" type structure, thus depriving private parties of the unfettered initiative which they instead enjoy in the free market. Regulation thus has the added effect of shifting the sphere of competence from the private to the public realm (Gleiser and Shleifer, 2003).

In effect, especially for questions of strong social import (such as financial crises or pollution), even though there is theoretically scope for individual action, regulation is regarded as the most appropriate response for pursuing the collective interest, precisely because it relies upon a higher authority that is presumed to be *super partes*, and representative of the collective. This position, which could be contested from a strictly economic perspective, is explicitly intended to focus emphasis on the public interest (Rose-Ackerman, 1991; Spulber, 1989). Such an approach is

therefore inherently political, since it tends to emphasise the pre-eminence of central power in solving a particular problem, and seeks to create consensus around a public decision.

There is also the practical question of the technicalities involved in protecting certain individual or collective interests. As in other productive activities, these may call for specialist knowledge that "generalist" individuals or bodies such as governments are unable to command (Glaeser, Johnson & Shleifer, 2001). The creation of separate institutions—generally administrative agencies—is intended precisely to favour the accumulation and concentration of specialist knowledge about the sectors being regulated, as routinely happens today in the case of financial markets, environmental pollution, telecommunications, drugs, and the like[5].

Such a solution makes it possible to exploit the comparative advantage of specialist organisations in solving problems that require specific competencies, while at the same time enjoying informational and implementational economies of scale[6].

Yet the "technical" response also inevitably causes a change in the distribution of power, since the described solution does not just have the effect of fostering development of technical know-how; it also delegates —albeit within a clearly delimited scope– part of the legislative and executive power to the agencies themselves, who consequently "make rules, and adjudicate them", significantly derogating from the separation of powers called for by the conventional democratic framework (Georgakopoulos, 2005, p. 40)[7].

Such a situation may be problematic in that it alters the balance of power between legislators, who represent (or ought to represent) the collective interest, and the bureaucracies, which may receive incentives that conflict with the legislators' political mandate, causing them for example to pursue the direct interests of those who govern the agencies. This can have quite severe consequences on the rule-making process, and hence on regulatory innovation (Spulber, 1989).

Though closer links between regulator and regulated sector can, on the one hand, make it easier to understand and tackle issues, they can also have two effects that amplify the above problem. First of

[5] Interestingly, Nelson and Winter (1982, p. 134) cite productive organisations– i. e. a relevant group of individuals such as a firm--but this can apply equally to regulatory agencies, which are institutions devoted among other things to embodying knowledge that is "not consciously known or articulable by anyone in particular", yet effective and crucial for the activity.

[6] "The justification of administrative agencies rests on the development of specialized areas of knowledge that created a need for the administration of their regulation by specialists […] who are at the best position to administer an area of law that corresponds to new complex technological interactions (Georgakopoulos, 2005, p. 41)

[7] Similar criticisms have also been levelled against individual legal action which, according to some authors, "threatens democracy" because it replaces the will of the majority as expressed through elections with that of individual action or of the judiciary power (as expressed by H. Sterling Burnett of the National Center for Policy Analysis, as reviewed in Cook & Ludwig, 2002). Therefore, at least in this sense, the two systems elicit similar comments.

all, there is the possibility of "regulatory capture", and of various forms of collusion, as extensively discussed in the literature, may fossilise regulation and regulatory change (since Stigler, 1971)[8];
Secondly, the narrower perspective of specialist agencies can impair their ability to take a wide-ranging view of society, and especially to perceive when there is broad consensus among citizens as to new needs and regulatory choices. This, coupled with the bureaucratic character of administrative agencies, makes regulation unresponsive compared to the "sensitiveness" of the market, so that the rule-making process is invariably convoluted and slow moving.
The above elements, taken together, provide a reasonable explanation for the regulatory failures which occurred in the cases of asbestos and breast implants.

4. Regulation and litigation: an evolving relationship

The discussion thus far has concerned the general case of regulation in the market, but seems equally appropriate for examining the relationship between regulation and tort law; the latter is in effect a sort of specialised market—operating through the court system--for protecting the interests of parties, and as such is likewise susceptible to what might be termed a judicial market failure (Cassone & Ramello, 2011).
In this case, the interplay between tort and regulation is important not just for determining the allocation of resources, but especially for promoting the production of certain public goods—namely justice and deterrence--with a view to minimising the social cost of accidents (Calabresi, 1970).
The interaction between regulation and litigation has been a subject of ongoing debate, among both academics and public policy-makers. While it is possible to assert that originally "[…] the regulation of markets was a response to dissatisfaction with litigation as a mechanism of social control of business" (Glaeser & Shleifer, 2003, p. 401), in recent decades the law and economics debate has detected a comparable weakness in regulation, suggesting that there is a more complex relationship between these two systems, played out essentially on three levels. These are, depending on the perspective of analysis one adopts:

- A relationship of substitutability

[8] The main idea is that in such cases a firm may inappropriately water down the regulations to obtain a private benefit–such as a desired price regime–or to render them irrelevant, while the authority can increase its budget or its bribes. According to this view, a number of laws passed in the US can in reality be ascribed to strategies of market foreclosure, such as raising rivals' costs (Glaeser & Shleifer, 2003).

- A relationship of complementarity
- A relationship of causality

The substitutability relationship corresponds to the conventional law and economics view that both regulation and litigation are systems devoted to remedying accidents, and hence to averting the erosion of social welfare arising out of negative externalities (Wittman, 1977).

Accordingly, the central question dominating the literature is whether regulation or litigation should be endorsed for tackling market failures. *Ex-ante*, a perfectly informed regulatory authority should be able to set up an optimal incentive scheme that causes tortfeasors to adopt efficient levels of prevention. *Ex-post*, harmed individuals should always be able to protect their own interests and receive full and proper compensation, provided the liability system is complete (Calabresi, 1970; Shavell, 1987). Thus, in an ideal world, liability and regulation would be perfect substitutes for each other, so that either one could be used.

However, if there are any imperfections, neither system may be able to produce an efficient outcome on its own account. In this case, a combination of regulation plus liability may be needed to give economic agents a full set of incentives, and achieve at least a second-best solution. In a seminal work, Shavell (1984a) examines the combined use of *ex ante* and *ex post* regulation as a means for controlling risk and solving the puzzle of how to produce a socially desirable level of prevention, suggesting four determinants for choosing which better applies in a given setting[9].

Kolstad, Ulen and Johnson (1990) explicitly note that the liability system is systematically used to correct the shortcomings of imperfect regulation, arising from the difficulty of defining proper and complete *ex ante* standards. Thus, the coupling of regulation and tort law is necessary to ensure an optimal level of prevention, and the two system should be regarded as complementary for minimising the cost of accidents.

Other authors reach a similar conclusion by analysing the susceptibility of both tort law and regulation to capture by specific parties. This is one of the reasons that prompted the design of regulatory institutions to avert the danger of corruption of United States judges (Glaeser & Shleifer, 2003), and similar arguments apply for the weakness of regulation vis-a-vis the regulated entities (Stigler, 1971; McChesney, 1987).

In summary, the prevailing orientation, in a wide range of cases, is for the two institutional technologies to be viewed as complementary for pursuing efficiency. This is borne out by empirical evidence from specific sectors, such as insurance (Helland & Klick, 2007).

[9] Other authors argue in favour of either one or the other system also for contingent reasons, connected with the degree of exposure to subversion by potential violators (Glaeser & Shleifer, 2003), or with other specific attributes (see for instance the somewhat antithetical opinions of Cane, 2002 and Hylton, 2002).

4.1. Liability and regulatory change

However there is also a third relationship between the two systems, which takes the form of a causal link between liability and regulation. In effect, liability produces not only deterrence, but also positive externalities in the form of other public goods, such as information externalities for the parties involved in the litigation and for consumers, standardization of care, development of knowledge and, in the case of collective litigation, as we shall see below, also the creation of consensus (Burch, 2008; Arlen, 2010; Deffains & Langlais, 2011). Such effects concern society as a whole, but in many cases also furnish inputs which regulation can use to regenerate itself. In particular, information externalities, standardization of care and new knowledge serve as direct inputs to regulation, while the presence of consensus among a multitude of victims can act as a trigger for regulatory change. In other words, aggregate litigation can become a sort of R&D laboratory, in which plaintiffs act as a proxy for society, and the judicial solution serves as a prototype for regulatory change[10].

An action representing a large number of individuals has the added advantage of giving a more robust signal of how well regulators' decisions are meeting the needs of the regulated subjects.

The opposite route, of decisions taken unilaterally by regulators, can lead to glaring errors like the celebrated case of the Food and Drug Administration's ban on cyclamates and then saccharin, which the US Congress later reversed in favour of labelling and individual choice, following public outcry (Gruenspecht & Lave, 1989).

The alternative, otherwise, is to embark on a wide-ranging consultation process that further slows down regulatory change; even then, identifying sharp social goals can prove quite difficult.

Viewed in this light, aggregate litigation provides a sort of natural field experiment for regulation, "where the environment is one where the subjects naturally undertake these tasks and where the subjects do not know that they are participants in an experiment" (List, 2006, p. 8). As discussed in the experimental economics literature, the outcome of a field experiment gives policy makers a useful testing ground in which to observe, on a small scale, the consequences of their projected measures. Such a model has in fact already been applied in the law-making process, at least in the US where "much of what is introduced as "new" legislation at the top level of federalist systems is oftentimes experimented with at lower levels and found to be successful". This is exemplified by the famous historical precedent of the New Deal: President Roosevelt himself in fact affirmed that

[10] Glaeser & Shleifer (2003) observe an interesting correlation between the evolution of tort law and that of the railroads, which naturally preceded the development of regulation.

"[p]ractically all the things we've done in the federal government are the things Al Smith did [formerly] as governor of New York." (List, 2006, p. 9).

Collective civil action has the further benefit of more forcefully countering the skewing of regulation toward interests groups, which is one of the traditional obstacles to regulatory innovation, and even a means for the regulated sector to extract rents (Friedman, 2000).

In short, the amendment to civil procedure (which as we shall see offers the group of victims a productive framework that enables them to access economies of scale and transfer risk) not only promotes efficiency but has the further, no less important, effect of creating a "countervailing power" to that of the stronger economic actors, thereby attenuating the classic problem in markets and regulation of "inequality of weapons", i.e. economic inequality among parties involved (Glaeser, Scheinkman & Shleifer, 2003).

To be sure, the administrative concentration that characterises regulation facilitates political pressure by interest groups, who find themselves well-placed to steer *ex-ante* bureaucratic rule making, naturally to the detriment of efficiency, the proper role of regulation, and the fair representation of all social parties (Rose-Ackerman, 1995)[11].

Finally, regulatory agencies are more subject to the rigidities—evocatively termed "ossification" (Burch, 2008)—arising from the political constraints and preferences of bureaucracies, and often also limited by procedural rules imposed by legislators to curb their discretionary power.

Now, regulatory innovation, as a deviation from the status quo of a given political equilibrium, represents a risk for bureaucracies, which generally prefer to pursue practical results rather than take risks with innovations (McCubbins & Page, 1986).

Tort law and aggregate litigation thus become a sort of "incubator" for regulation, collecting signals from the market and society in real time, raising awareness among administrative agencies and politicians, and imparting the momentum for regulatory change. This can even happen in cases where the plaintiff loses the lawsuit, if it still creates enough mobilization to bring about a change of the existing system (NeJaime, 2011).

Regulatory change can take place through strictly judicial routes, especially in common law systems where rulings have a legislative effect—a mechanism that some have criticised as overstepping the bounds of normal legislative activity (Viscusi, 2002)--or more indirectly, i.e. by using the litigation, its outcome and other surrounding elements as signals for the rule-maker.

Liability can thus continue to perform its function of protecting victims and producing deterrence, thereby pursuing static efficiency, but also becomes an instrument for pursuing dynamic efficiency,

[11] Rose-Ackerman (1995) discusses how, in certain institutional settings, citizens can essentially be excluded from bureaucracies' regulatory amendments.

to the extent that it fosters regulatory change, by a consolidated paradigm that stimulates production of an innovation, as we shall see below, through an ad hoc system of private incentives.

It is interesting to observe that, at least in the case of class action, this role seems to be tacitly recognised. In effect, the divide between its supporters and detractors disappears when it comes to acknowledging class action's contribution to public policy, both directly by filling the gaps in administrative regulation, and indirectly by promoting optimal regulation design (Helland & Klick, 2007). A similar influence can be observed in the case of securities class actions, and their effects on the regulation of financial markets (Burch, 2008).

5. The nature of aggregate litigation

The causal relation between litigation and regulatory rule-making relies on special conditions that make it possible to promote social welfare by allowing an innovator to partially appropriate the social value of the regulatory innovation. However such a dynamic does not emerge spontaneously, but requires solving the organisational puzzle of reconciling enforcement of the dispersed victims' rights, the private interests of one or more attorneys—henceforth termed the plaintiffs' counsel or simply the attorney—and the social interest of producing the public goods of deterrence and, of course, regulatory change.

In general, whenever there are high transaction costs, excessive fragmentation of rights, lack of coordination or significant asymmetries between parties, such that there is underutilisation of individual rights, pooling those rights together may represent the more efficient solution. This happens not so much by eliminating the pre-existing rights, which would constitute an infringement of those rights and so also reduce their value in economic terms, but by creating economic institutions capable of drawing together such rights and managing them collectively, in the manner predicted by Olson (1965). Within the domain of property, for example, Heller and Eisebenberg (1998, p. 700) assert that “[when] the background legal rules threaten to waste resources, people often rearrange rights sensibly and create order through private arrangements”.

The mechanism of aggregate litigation follows the same rationale, and thus works by reorganising victims into a litigation, bound by the rules of civil procedure, in order to more efficiently exercise certain specific rights.

Albeit with some resistance, especially in civil law systems, various jurisdictions have in recent years been pressed to institute solutions that can facilitate or make practicable collective redress. The European Community, for example, is currently under siege and has embarked on a wide

ranging consultation for introducing this instrument within its member states[12]. This takes its cue from local initiatives that have from time to time sought to create *sui generis* aggregate litigations, either by using the criminal process, or simply by forum-shopping for jurisdictions that permit aggregate litigations, as in the cases of Parmalat or Lufthansa Cargo Airline, where the victims, respectively in Italy and Germany, tried with varying degrees of success to access the US class action system (Porrini & Ramello, 2011)[13]. In similar vein, many European financial institutions acted as lead plaintiffs in a number of US securities class actions litigated under the Private Securities Litigation Reform Act, whereas they could not even have filed such a lawsuit in Europe (Gelderman, 2006). These examples, even if fragmentary, confirm that in some jurisdiction there are significant gaps in victims' protection--a situation that also has repercussions on regulatory innovation.

The twofold failure of individual litigation and regulation is essentially explained by the fact that neither institution is able to produce the appropriate incentives for obtaining an efficient result. In other words, these two production "technologies" are unfitted for the context in which they operate, so that the solution must go by some alternative route. Whereas regulation suffers from the previously described structural rigidity, which cannot be radically eliminated, the judicial market offers scope for alternative solutions which, by shifting the boundaries of litigation, may attain a more satisfactory "productive" configuration than that of individual action. The argument here mirrors that used for explaining the emergence of hierarchies when there is a need to internalise externalities, for example in the well-known problem in economics of indivisibility in production, which arises in the case of economies of scale (or scope), and makes it impossible to rely on the competitive market for optimal allocation of resources (Edwards and Starr 1984).

Indivisibility plays a prominent part in the understanding of industrial organisations, and of course likewise affects the market structure. In consequence, the different organisations and multiple forms of enterprises in the market, and of aggregate ventures in the judicial market, should be regarded as institutional solutions designed to achieve adequate productive configurations for specific contexts. Naturally, the possible divergence between the interests of individuals and those of the newly created group raises issues in aggregate litigation that mirror those studied in firm theory, such as the conflict of interest between owners and managers[14]. The solution, in both cases, lies in creating a set of incentives that produces a convergence of interests; in general, this is

[12] Ref. “Towards a Coherent European Approach to Collective Redress”, SEC(2011)173 Final, February 4, 20

[13] Italy and Germany, in response to these pressures, have recently introduced particular forms of aggregate litigations which are, however, much more severely constrained by procedural restrictions than in America (Henseler, 2011).

[14] The problem of finding the optimal incentive also applies to the relationship between an individual plaintiff and attorney (see Halpern & Turnbull, 1983 and for a more recent discussion Sacconi, 2011).

achieved by entitling the agent to appropriate a share of the expected benefits, a situation which grants a *de facto* property right over a portion of the proceeds of the productive activity to the party that is best able to promote efficiency. In the case of liability, this is often the plaintiff's counsel.

It is worth noting that the creation of a hierarchy defines an exclusive right over the specific productive activity. Such a right, in the judicial market, corresponds to a specific legal action, and thus in practice means creating a local monopoly on a particular litigation. This aspect is by no means peripheral to the incentive system in the case of collective redress: it is a prerequisite for being able to assign a property right over the potential rewards of the legal action. Such a right, in its turn, becomes the central element (i.e. the price) for achieving transfer of risk through a contingent fee reward scheme. The party financing the legal action – often the attorney – thus obtains the right to extract a portion of the awarded proceeds as a remuneration for the risk[15].

The currently available reference models for aggregate litigation are those of the US legal system, whose Rule 20, Rule 23 and Rule 42 of the Federal Rules of Civil Procedure and Section 1407 of Title 28 of the United States Code, taken together, introduce various ways of pursuing aggregate litigation in the form of class action, multi-district litigation, formal consolidation and other solutions, thereby redrawing the boundaries of litigation.

Rule 23 is the most well-known, in that it introduces class action, which has the role of exhausting in a single litigation all possible claims of a predefined population of victims[16]. Among the technicalities of class action, there is also the indirect representation of victims who are unable to join the legal action on their own account (so-called absent parties). The other solutions, in a more fragmentary way, promote collective or coordinated legal actions which for example "involve a common question of law or fact [and in which] the court may: (1) join for hearing or trial any or all matters at issue in the actions; (2) consolidate the actions; or (3) issue any other orders to avoid unnecessary cost or delay" (Rule 42a, 2009 edition).

While the specific technical features of each procedural solution are discussed elsewhere (Hensler, 2001 & 2011; Calabresi & Schwartz, 2011), in all cases one of the key criteria for choosing between them is efficiency--meaning the extent to which the aggregation is able to pursue expedition and economy.

Hence the different forms of aggregation can be compared to the different types of business entities (e. g. public company, joint venture, etc.), whose function it is to best exploit the advantages of the hierarchy in different situations. Under this analogy, in the productive organisation of the judicial

[15] Naturally this can be a single attorney, a law firm, or a consortium of attorneys. The current debate is even examining the possibility of finding ad hoc financial solutions, for example using third parties to finance the aggregate litigation, as happens in many productive activities; this is even more important in jurisdictions where fee-shifting is required, thus making it necessary to take out an insurance policy or security bond against potential adverse costs (Hensler, 2011).

[16] For a more detailed discussion of class action see for example Calabresi & Schwartwz (2011).

market, class action lies at one extreme, since it exhausts in a single litigation the claims of a broad population of victims who become shareholders in the legal action (essentially a sort of public company). The other solutions occupy intermediate positions, making it possible to exploit some benefits of aggregate litigation even in situations where all the victims cannot join in a single lawsuit, so that a class action is not practicable (and might in fact even be invalidated)[17].

6. Regulatory innovation through litigation: how it works

The various forms of aggregate litigation have distinct procedural features which differentiate them from each other. However they all share the common feature of being organisational solutions designed to remedy the market failures of individual action, that arise essentially out of cost asymmetries (litigation cost or opportunity cost of filing the lawsuit), informational asymmetries (the victim knows less than the tortfeasor) and risk management asymmetries (if the tortfeasor is a corporation, it is better able to manage the risks associated with the litigation than the individual claimants) between the plaintiffs and the defendant.

As previously argued, the extreme case is that of class action, where aggregation makes it possible to vindicate claims that would otherwise never be litigated. In other cases, collective lawsuits are aimed more at promoting efficiency in the judicial market, on the side of both the plaintiffs and court. In other words, aggregate litigations make it possible to pursue "judicial economy" (Berstein, 1977), favouring the emergence of economies of scale in litigation and efficiency in general, avoiding the problem of different courts handing down conflicting decisions (which then have to be resolved), and consolidating the role of victims who thus face lower costs and are better placed to take part in the action.

Aggregation by itself is, however, only one of the elements that make this new organisational form of litigation effective; the other pillar supporting the system is the contingent fee reward scheme, by which the risk is transferred to the party best able to manage it—generally an attorney or group of attorneys in the US (or sometimes an ad hoc financial venture, as in the Netherlands; Hensler, 2011) in exchange for a property right over a share of the expected proceeds of the litigation.

This view implies that the organisation of aggregate litigation must be complemented by a specific market for risk, so as to allocate the risk to the party best able to manage it. Such a solution is

[17] This is precisely what happened in some asbestos cases, where two proposed class action settlements were invalidated by the US Supreme Court (Amchem Products Inc. v. Windsor 521 U.S. 591, 1997, and Ortiz v. Fibreboard Corp. 527 U.S. 815, 1999).

comparable to what generally happens in business firms, and aggregate litigations can also become a means for gathering venture capital, if there is a suitable governance system that can provide sufficient and aligned incentives for "shareholders and management".
The contingent fee reward scheme thus becomes comparable to a stock option issued to a financing party, designed to align the interests of the attorney and plaintiff while at the same time providing an economic incentive for investing in the legal action (Backhaus, 2011; Cassone & Ramello, 2011).

6.1. The economics of regulatory innovation through aggregate litigation

The mechanism which governs aggregate litigation thus rests on a reward scheme common to many economic settings, including that of innovation. Such a scenario can be formally described as follows:

$$TC(n) = \begin{cases} 0 & n = 0 \\ L + nc & n \geq 1 \end{cases}$$

$TC(n)$ are the litigation costs, which depend on the number of plaintiffs n, the attorney's opportunity cost c for the defence of each client, and the fixed costs L that represent the costs of operating in the judicial market, which for example may include accessory costs that are however necessary for the action, such as expert surveys or other technicalities specific to the lawsuit[18]. Therefore, when the action becomes collective or consolidated, such costs are borne jointly and thus make it possible to attain economies of scale for the plaintiffs[19].
For ease of analysis, let us set the value $c = 0$.
$0 < p < 1$ is the probability of winning the litigation, and D are the proceeds arising from the litigation (damages awarded by the jury or settlements); let us hypothesise that these are defined in a way that satisfies the criterion of full internalisation of the harm, i.e. such as to minimise the

[18] Stylization provides a compact way to capture the effects of the economies of scale produced by aggregation, and which can concern not just fixed costs but also other variables, such as the timescale of the proceeding, whose duration for the group of the victims is less than sum of the durations of the individual proceedings (White, 2006).
The literature concurs that, irrespective of the chosen form of aggregate litigation, expert witnesses, factual investigation and other technicalities specific to the procedure can create economies of scale (Erichson, 2005).

[19] The representation does not alter in the case of multiple attorneys. For example, if there are 2 attorneys the costs will be $L + n_1 c + n_2 c$, where $n_1 \neq n_2$ are two different groups of victims.

social cost of accidents (Calabresi, 1970). The overall outcome of the system will thus be to transfer this cost onto the tortfeasor, thereby promoting deterrence and regulatory innovation.

Let us further assume risk-neutral individuals. The expected litigation profit of the entire group of litigants n is then described by the following Bernoulli equation:

$$E\pi_A(n) = pD - L \qquad (1)$$

The lawsuit will be filed by the victims if the expected net profit is non-negative, that is:

$$D \geq L / p \qquad (2)$$

In other words, the damages awarded must be greater than the litigation costs for any value of p.

Now let us further assume that there are indivisibilities in production, so that the proceeds in the case of individual litigation are equal to Z such that $D > nZ$, and that this value is less than that required for the full internalisation of accidents. Then there might be a case for failure of individual litigation.

Each of the n would-be litigants would then face an expected profit $E\pi_n(1) = pZ - L$, and either of the following situations might occur, $pZ \geq L$ or $pZ < L$. Let us also assume for now that the individual litigations are statistically independent, and that the judiciary is an efficient technology, so that the outcome of comparable cases will always be the same.

In the case $pZ < L$, no individual litigation will be undertaken, and indeed aggregate litigation becomes the only way for protecting non-vindicated claims[20].

Where $pZ \geq L$ holds, a sum of n lawsuits will be filed and the expected profit of the litigation "industry" will then be:

$$E\pi_n(n) = n(pZ - L) \qquad (3)$$

We can see that the aggregate litigation can still be the more efficient organisational arrangement for vindicating claims and producing public goods such as deterrence and regulatory innovation.

In point of fact, aggregate litigation becomes inefficient only when the following condition is satisfied $E\pi_n(n) \geq E\pi_A(n)$. Now, by substituting and solving it easy to see that this corresponds to the following condition :

[20] In this case specific systems are needed to convert negative expected value litigations into profitable ventures. Class action is able to achieve this effect (Cassone & Ramello, 2011), or other mechanisms can be envisaged (De Mot & Depoorter, 2010).

$$nZ \geq D - (1-n)L / p \qquad (4)$$

which is true only when $n = 1$ and there are no indivisibilities, so that the outcomes of aggregate and individual litigations coincide. Otherwise, when $n > 1$ aggregate litigation is always more efficient since condition (4) cannot hold.

Until now, we have however hypothesised a competitive market in which litigation for the plaintiff is essentially cost based, and all the expected benefit goes to compensate the victims.

Let us now extend the scenario by positing that aggregate action requires a specific system of incentives, to motivate an individual to take on the burden of pursuing or promoting the legal action. The machinery of aggregate litigation, in its various forms, in fact calls for the efforts of an actor—or group of actors--with the capability and motivation to finance and manage the complex endeavour of producing justice. Such an actor can be likened to an entrepreneur who bears non-insurable risks and introduces innovations in exchange for opportunities to profit. These profits remunerate the factors of production and compensate for the risk.

As we have said, this "lead" actor is generally an attorney or a law firm that takes on the risk in exchange for the right to appropriate a share θ of the expected profits. This appropriation requires creating a legal monopoly over a specific litigation, to make the expected private benefit high enough to provide a sufficient incentive whilst also stimulating production of public goods. The described situation mirrors an institutional mechanism widely used in intellectual property, where the (temporary) legal monopoly assigned via patent over a knowledge item produces a level of appropriability that is lower than the social value of the invention, and hence an expected reward sufficient to motivate the inventor to produce new knowledge[21]. Therefore, θ measures the property right over the expected proceeds, assigned to the party who promotes, finances and manages the litigation, referred to here for conciseness as the attorney.

The expected profit for the entrepreneurial attorney of the aggregate action will thus be:

$$E\pi_A(n) = \theta(pD) - L \qquad (5)$$

which therefore implies the condition $\theta D \geq L / p$. Given that condition (2) applies, the value of the appropriation must be $0 < \theta < 1$, and this means the expected benefits must strictly exceed the litigation costs for the attorney to also receive a sufficient reward, and that the compensation of the

[21] In the case under study, the social value is greater than *D* since it also includes the positive externalities discussed previously. For a short discussion of the incentives for innovation see e. g. Ramello (2005).

victims will never be complete. Accordingly (2) becomes $D > L/p$ which is also the profitability condition which discourages filing of lawsuits that do not meet this criterion.

Moreover, if we rewrite the preceding inequality as $\theta \geq \frac{L}{D}\frac{1}{p}$, it is clear that that with decreasing probability of success of the legal action, the property rights have to increase. This reveals the direct relation with remuneration of the risk.

6.2. Aggregate vs *test plus* litigation

An alternative litigation solution consists in undertaking a test trial which produces a precedent, and for the other victims to be compensated according to its outcome (henceforth test plus). The simplified scenario sees an attorney filing suit with a payoff described by $E\pi_A(1) = \theta_T(pZ) - L$ (i.e. the appropriability is limited only to the test case) while the other $n-1$ victims, at no cost, fill out an administrative form (or pay only the opportunity cost of the attorney, here taken to be $c = 0$) to have the right to the individual proceeds in case of success, i.e. $E\pi_{n-1}(1) = pZ$ for any other $n-1$ plaintiffs.

In this case the participation constraint becomes $\theta_T Z \geq L/p$ where θ_T measures the property right restricted to the test case.

The fixed cost of litigating will be the same as for aggregate litigation, thus avoiding duplication of costs, but the industry profit will be lower than in the case of aggregate litigation because of indivisibilities. This can be easily seen by comparing the aggregate profit of the industry in both the case of equation (1) for aggregate litigation and:

$$E\pi_T(n) = npZ - L \qquad (6)$$

for test plus joint complaints. Setting (1) equal to (6), the test plus method will be better only under the condition $Z > D/n$, which violates the indivisibility hypothesis. Moreover, if the incentive for the attorney is a decisive element for the legal action, this requires a higher share of appropriation, as described by the inequality:

$$\frac{\theta_T}{\theta} \geq \frac{D}{Z} \qquad (7)$$

even in the case where there are no economies of scale, and the right hand side is equal to n . It follows that the value of Z might anyway not be high enough to supply an adequate incentive.

This means that, in line with the insight of Calabresi (1961), producing an effective countervailing power to spreading losses calls for a parallel spreading of costs. This argument is also relevant to discussing the role of legal monopoly over a class of litigations, i.e. "civil actions involving one or more common questions" (28 U. S. C. § 1407), since it is consistent with the need to produce adequate incentives. In fact, this line of reasoning represents the rationale for giving a single party a legal monopoly over a litigation category, since without this regulatory solution it is likely that no individual will have a sufficient incentive to sustain the test litigation costs.

It is interesting to note that some jurisdictions have adopted systems similar to test plus, and have consequently had to devise formulas capable of promoting and financing the test case. One example is the Capital Markets Model Case Act (know as the ''KapMuG''), enacted in Germany in 2005, and designed to enhance investor protection through a system of test trials and linked actions. In order to solve the free-riding problem, it strictly regulates the manner in which the test-case and follow-on cases are related to each other (Hilgard & Kraayvanger, 2007).

7. Conclusions

The current failure of individual civil action and regulation in certain jurisdictions has called attention to alternative systems for protecting victims' rights and producing deterrence of harmful behaviour.

One practicable solution to this two-fold failure is aggregate litigation, which offers an array of organisational solutions designed to reinstate the functionality of the tort system. This suggests that the judicial market is comparable to any other productive activity, and that organisation can offer a solution to the problem of collective action also in the case of litigation. There is in fact no special reason why a 'one size fits all' solution, which can never be found in most human and economic activities, should instead exist in the case of liability.

After all, the court system does not merely administer "justice" but also produces goods and allocates rights, and from this perspective aggregate litigation can be seen as an alternative organisational solution better able to promote efficiency when other institutions fail to do so.

In this article, we have argued that aggregate litigation can not only restore the production of victims' compensation and deterrence, but also plays a pivotal role in stimulating regulatory innovation. This is accomplished through a reward system that seems largely to mimic the

institutional devices used in other domains, such as intellectual property rights, by defining a proper set of incentives. These incentives then make it possible to pursue the additional goal of dynamic efficiency.

The described system relies on creating a specific economic framework, able to foster economies of scale and grant a valuable property right over a specific litigation to an entrepreneurial individual, who in exchange provides the venture capital needed for the legal action, and produces useful inputs for amending regulations.

In this light, aggregate litigation thus serves as an incubator for regulation, making it possible to comprehensively surmount the traditional rigidities that hamper administrative agencies, thereby facilitating regulatory change.

References

Arlen J. (2010), 'Contracting over Liability: Medical Malpractice and the Cost of Choice', *University of Pennsylvania Law Review*, 158, 957-1023.

Barbalace, R.C. (2004a), 'A Brief History of Asbestos Use and Associated Health Risks', *EnvironmentalChemistry.com*, Last Access on-line: 10/5/2011

http://EnvironmentalChemistry.com/yogi/environmental/asbestoshistory2004.html

Barbalace, R.C. (2004b), 'Asbestos: A Manufacturing Health Hazard Dating to Prehistoric Times', *EnvironmentalChemistry.com*, Last Access on-line: 10/5/2011

http://EnvironmentalChemistry.com/yogi/environmental/asbestoshealthhazards.htm

Bernstein, R. (1977), "Judicial Economy and Class Action", *Journal of Legal Studies*, Vol. 7,No. 2, pp. 349-370.

Brown, John P. (1973), 'Toward an Economic Theory of Liability', **2** *Journal of Legal Studies*,

323-350.

Burch E. C. (2008), 'Securities Class Action as Pragmatic *Ex-Post* Regulation', *Georgia Law Review*, 43, 63-131

Calabresi, G. (1970), *The cost of accident*, New Haven: Yale University Press.

Calabresi G. & Schwarts K.S. (2011), 'The costs of class actions: allocation and collective redress in the US experience', *European Journal of Law and Economics*, 32, 169-183.

Cane P. (2002), 'Using Tort Law for Enforcing Environmental Regulations?', *Washburn Law Journal*, 41, 427-467.

Carroll, S.J., Hensler, D., Gross J., Sloss, E.M., Schonlau M., Abrahamse A. and Ashwood, J.S. (2005), *Asbestos Litigation*, RAND Corporation, Santa Monica, CA.

De Mot, J. and Depoorter B. (2010), 'Tort law and probabilistic litigation: How to apply multipliers to address the problem of negative value suits', *International Review of Law and Economics*,30, 236-243.

Deffains B. & Langlais E. (2011), 'Informational externalities and settlements in mass tort litigations, *European Journal of Law and Economics*, 32, 241-262.

Edwards, B. K., & Starr, R. M. (1984), 'A note on indivisibilities, specialization, and economics of scale', *American Economic Review*, 77, 192–194.

Erichson H.M. (2005), 'Mississippi Class Actions and the Inevitability of Mass Aggregate Litigation', *Mississippi College Law Review*, 24, 285-296.

Friedman, D.D. (2000), *Law's Order. What Economics Has to Do with Law and Why it Matters*, Princeton University Press, Princeton.

Gelderman, G.A. (2006), "The fundamentals of assets recovery", *Investment and Pensions Europe, May*, pp. 2-3

Georgakopoulos, N. L. (2005), *Principle and Methods of Law and Economics. Basic Tools for Normative Reasoning*, Cambridge University Press, New York,

Glaeser, E.L., Johnson, S. and Shleifer, A. (2001), "Coase Versus the Coasians", *Quarterly Journal of Economics*, Vol. 113, No. 3, pp. 853-899.

Glaeser,E.L. and Shleifer, A. (2003), "The Rise of the Regulatory State", *Journal of Economic Literature*, Vol. 41, No. 2, pp. 401-425.

Glaeser, E.L., Scheinkman J. & Shleifer A. (2003), 'The Injustice of Inequaliy', *Journal of Monetary Economics*, 50, 199-222.

Gruenspecht HK. And Lave L. B. (1989), 'The Economics of Health, Safety, and Environmental Regulation', in Armostrong M. and Porter R.H. (eds), *Handbook of Industrial Organization*, Vol. II, North Holland-Elsevier, Amsterdam.

Halpern, P.J. and Turnbull, S.M. (1983) "Legal Fees Contracts and Alternative Cost Rules: An Economic Analysis." *International Review of Law and Economics*, 3,3-26

Helland, E. and Klick, J. (2007), 'The Trade-off between Regulation and Litigation: Evidence from Insurance Class Actions', *Journal of Tort Law*. 1, 1-24.

Heller, M. and Eisenberg, R. (1998), "Can Patents Deter Innovation? The Anticommons in Biomedical Research", *Science*, 280: 698-701.

Hensler D. R. (2011) 'The Future of Mass Litigation: Global Class Actions and Third-Party Litigation Funding', *George Washington Law Review*, 79,306-323.

Hensler D. R. (2001), "Revisiting the Monster: New Myths and Realities of Class Action and Other Large Scale Litigation', *Duke Journal of Comparative and International Law*, 11, 179-213.

Hersch J. (2002), 'Breast Implants: Regulation, Litigation and Science', in Viscusi (2002).

Hilgard M.C. and Kraayvanger J. (2007), 'Class Action and Mass Action in Germany', *International Bar Association Litigation Committee Newsletter*, September, 40-41.

Hylton K.H. (2002), 'When Should We Prefer Tort Law to Environmental Regulation?', *Washburn Law Journal*, 41, 515-534.

Kolstad, C.D., Ulen T.S. and Johnson, G.V. (1990), "Ex-post Liability for Harm vs. Ex-ante Safety Regulation: Substitutes or Complements", *American Economic Review*, 80, 888-901.

List J. A. (2006), 'Field Experiments: A Bridge between Lab and Naturally Occurring Data', *Advances in Economic Analysis & Policy*, 6, 1-45

McChesney, F. (1987), 'Rent Extraction and Rent Creation in the Economic Theory of Regulation', *Journal of Legal Studies*, 16, 101-118.

McCubbins, M.D., and Page, T. (1986), 'The Congressional Foundation of Agency Performance', Public Choice, , 51, 173-190.

NeJaime, D. (2011), 'Winning Through Losing', *Iowa Law Review*, 96, 941-1012.

Nelson, Richard R. and Sidney G. Winter (1982), *An Evolutionary Theory of the Economic*

Change, Cambridge, Mass: Belknap Press

Olson, M. (1971) [1965]. The logic of collective action: Public goods and the theory of groups (Revised edition ed.). Harvard University Press

Porrini, D., and Ramello, G. B. (2011). Class action and financial markets: Insights from law and economics, *Journal of Financial Economic Policy*, 3, 140-160.

Rose-Ackerman S. (1995), *Controlling Environmental Policy*, Yale University Press, New Haven.

Ramello, G. B. (2005), 'Property rights, Firm Boundaries, and the Republic of Science. A Note on Ashish Arora and Robert Merges', *Industrial and Corporate Change*, 14, 1195-1204.

Sacconi L. (2011), 'The case against lawyers' contingent fees and the misapplication of principal-agent models', *European Journal of Law and Economics*, 32, 263-292.

Spulber, D.F. (1989), *Regulation and Markets*, The MIT Press, Cambridge, MA and London

Stigler G. (1971), 'The theory of economic regulation', *Bell Journal of Economics and Management Science*, 2, 3-21.

Viscusi W.K. (ed., 2002), *Regulation through Litigation*, Brooking Institution Press, Washington DC.

White M. (2004), 'Asbestos and the Future of Mass Torts', *Journal of Economic Perspectives,* 18, 183-204.

Wittman D. (1977), 'Prior Regulation Versus Post Liability: The Choice Between Input and Output Regulation', *Journal of Legal Studi*es, 6, 193-211.