

Optimal allocation of penalties with judgment-proof injurers

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Extended Abstract

When a firm's activity may cause an accident to outside parties, how should be designed penalties to induce the firm to undertake enough safety measures, that is, what should be the optimal total amount of penalties and how should it be apportioned among the firm's members?

The earlier works of Newman and Wright (1990) and Segerson and Tietenberg (1992) suggest that only the total amount of penalties matters and not their allocation within the firm. The main argument relies on the existence of private transactions within the firm that can undo any allocation of responsibilities coming from the regulation authority. This result, known as the Equivalence Principle, had a significant influence on many works in the economic literature of tort and environmental law.

In this paper, I consider a situation in which the Equivalence Principle breaks down. This happens as soon as injurers may be judgment proof (see Shavell, 1986), that is, financially insolvent when facing the penalties imposed by the regulation authority. The injurer's inability to pay the penalties is highly plausible for two main reasons: (i) in case of environmental harm, it is likely that the amount of damage (and therefore, penalties) exceeds the injurers financial capacities, and (ii) the injurers may strategically conceal financial resources from the regulator by shifting resources from highly targeted injurers to less targeted injurers.

Under this assumption, the allocative role of penalties is restored. I then investigate how should the penalties be optimally allocated among injurers in the cases of simple

and double moral hazard.

First, I consider a firm (a principal) whose activity causes an harm to third parties with positive probability. To reduce this probability, the principal can delegate to an agent some effort of prevention. The agent's effort is supposed to be unobservable such that there is moral hazard. I also assume that the agent's initial financial resources are random at the contracting stage between him and the principal. In the absence of regulation, the principal has no incentive to induce the agent to exert effort as the harm does not affect her. Thus, I introduce a regulation authority who can impose *ex post* penalties on the principal and on the agent when an accident occurs. Obviously, as the agent has limited resources, he may not be able to pay for the penalties imposed on him.

In the literature, it is usually assumed that the transfers from the agent to both the regulation authority and the principal are designed *ex ante* such that they never exceed the agent's resources *ex post*. I depart from this modeling by allowing unbounded transfers in the first place, which will be truncated *ex post* in case of insolvency of the agent (or equivalently "judgment-proofness"). Indeed, if one assumes that the private transaction between the principal and the agent is generally not observed by the regulation authority, then there is no reason for the principal to ensure the agent's ability to pay for the penalties.

For a given regulation policy, I derive the equilibrium contract between the principal and the agent when the former has all the bargaining power. I find that the equilibrium level of effort of prevention decreases as the share of penalties imposed on the agent increases. This results stems from the fact that imposing a larger share of penalties on an *ex post* potentially insolvable agent acts as an *ex ante* decrease in the total amount of penalties imposed on the principal-agent relationship. It follows that if the regulation authority wants the firm to reduce as much as possible the probability of accident, it must impose the penalties on the principal only. Targeting the agent is always detrimental to the provision of effort of prevention.

Second, I investigate a situation in which two agents are responsible for exerting an (unobservable) effort of prevention and may both be potentially insolvable *ex post*. The regulation authority now faces a multiple tortfeasors problem where each injurer can be judgment-proof. The contracting problem between the two agents is now described as a double moral hazard problem in a partnership: In the first stage, agents sign a bidding agreement to maximize their joint profits and, in the second stage they simultaneously choose their level of efforts (similar to Cooper and Ross, 1985). In this problem, the sharing of profits among agents not only plays the traditional role of incentive provision in the partnership (due to moral hazard) but also the role of revenue concealment from the regulation authority.

When agents have symmetric initial resources distributions, the solution to this problem shows that agents sign a contract such that the profits in case of accident go to

the agent who is the least targeted by the regulation policy. This allows the partnership to escape as much as possible from the penalties and thus provide very low effort provision. This result resembles firms' strategies to create insolvent subsidiaries to escape from paying fines.

The optimal regulation policy of the partnership consists in an equal-sharing of the penalties among the two agents. Any other allocation of penalties results in a decrease in effort provision. Notice that when agents have asymmetric initial resources distribution, the optimal allocation of penalties is centered around the equal-sharing allocation adjusted by targeting more the agent with higher average initial resources. Furthermore, it is worth to stress that the optimal regulation does not depend on injurers' relative efficiency in reducing the probability of accident. This means that even if the effort of prevention of, say, agent 1 is twice as much effective as the effort of agent 2, there is no reason to target agent 1 more than agent 2 for this reason.

To summarize, this work examines the optimal allocation of penalties among agents who may be responsible of an accident. When injurers may be judgment-proof, I show that the regulation authority must always target the injurer with the largest financial resources, even if this injurer is not in charge of effort prevention (principal-agent case) or if his relative efficiency is low compared to the other injurer (partnership case). My findings mainly rely on the assumption that the private transaction between injurers is unlikely to be observed by the regulation authority and hence, there is no reason for injurers to ensure *ex ante* that they will always be solvent *ex post*. In particular, injurers strategically conceal profits from the regulation authority in the partnership case. This analysis also stresses that allowing the regulation authority to extend liability to solvent injurers in case of insolvency of others may help to better regulate firms.

References

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