



Inadequate compensation and multiple equilibria



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ABSTRACT

This paper studies alternative care situations in which the injurer is liable for harm but the victim is only partially compensated for her losses, for example, because the accident will result in serious bodily injury or death. In these situations, liability gives rise to multiple equilibria, some of them inefficient. We analyze possible solutions to the multiple equilibria problem including precaution costs liability and regulation. Notably, we show that in a dynamic setting punitive damages do not eliminate the inefficient equilibrium, but make its attainment less likely; we thus provide a novel justification for punitive damages which is consistent with legal doctrine and practice. Our analysis illustrates the importance of compensating victims, when feasible, rather than merely burdening injurers, for efficiency purposes. This suggests that common theoretical conclusions on accuracy in assessing damages and on decoupling damages and compensation, which leave victims only partially compensated, may not apply.

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1. Introduction

Accidents can sometimes be avoided by either the “injurer” or the “victim”. For example, an accident involving a motorist and a pedestrian on a zebra crossing can be prevented by either the pedestrian crossing when the road is clear, or the motorist stopping and letting the pedestrian cross safely. Similarly, the harmful consequences of pollution can be avoided by relocating either the polluting factory or the nearby residents. In these and many other cases, which are commonly known in the literature as “alternative care” situations, conventional wisdom dictates that the costs of the accident should be borne by the party who could have prevented the accident at the lowest costs, that is, on the least-cost avoider (Calabresi, 1970; Landes and Posner, 1987). Arguably, letting the least cost avoider bear the cost of the accident induces her to take care and prevent the accident if and only if it is efficient to do so.

This conclusion is valid if the injurer, when he is the least cost avoider, bears the entire costs of the accident, and the victim is compensated for the harm done to her. Unfortunately, however, there are many situations in which, although the injurer is the least cost avoider, he does not bear the entire harm, and consequently the victim is not fully compensated. Typical examples are courts' reluctance to award damages for standing-alone emotional

harm caused by negligence, the low amount of damages awarded for non-pecuniary damages in general, and the partial or no compensation at all for victims when the injurer goes bankrupt. But more interestingly, there are other situations where the least cost avoider injurer bears the entire costs of the accident but the victim is not fully compensated, or even not compensated at all. The best example is wrongful death cases. Even if we assume that the injurer bears full liability for the harm done, the victim obviously cannot be compensated: all the damages go to her dependents and heirs. Another example is damages for severe bodily injuries: whatever the amount of damages is, most victims would not consider compensation as equivalent to their bodily integrity, both *ex post* and *ex ante*.

Conventional law and economics teaches us that, as long as the injurer bears liability for the entire harm, under-compensation or no compensation of victims is not a problem, and might even be a virtue in some cases. That leads leading scholars to suggest, for example, that decoupling liability and compensation, in the sense that the injurer bears full liability, but the damages go to the state (or any other third party), makes an economic sense (Polinsky and Che, 1991). We argue that the conventional wisdom is wrong in this regard when it comes to alternative care cases. In these cases, when the injurer is the least cost avoider, his liability is not enough: compensation of the victim is a prerequisite for efficiency. The intuition of our argument is straightforward: in cases where the least cost avoider injurer is fully liable but the victim is not fully compensated, the injurer may opportunistically decide not to take care, relying on the incentives of the not-fully-compensated victim to take care and

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avoid her uncompensated harm. Similarly, the victim may decide not to take care, relying on the incentives of the injurer to take care and avoid liability. As a result, the injurer and the victim may both take care, may both refrain from taking care, or only one of them may take care.

To illustrate the problem, consider the following example, loosely reflecting the classical case *Beems*.¹ An injurer can prevent an accident resulting in the death of the victim by taking precautions that cost 20, and the victim can also prevent the accident by taking precautions that cost 40. In case of accident the injurer will be found liable and pay damages of 100 to the victim's dependents and heirs.

In this example, imposing on the injurer liability of 100 (or any liability higher than 20) should arguably induce him to take care and prevent the accident. If the injurer spends 20 to avoid the accident, the victim will have no incentive to take care, and efficiency is attained. However, since the accident results in the death of the victim, she cannot be compensated for her losses. Therefore, the victim has a strong incentive, even stronger than the injurer's incentive, to take care to avoid the accident, and the injurer is well aware of this. If the victim spends 40 to avoid the accident, the injurer has no incentive to take care, and inefficiency arises. In this example, it is not clear what the injurer and the victim would actually do, given the anticipated response of the other party, and it seems that any result could transpire: only the injurer takes care, only the victim takes care, both of them take care or none of them takes care. In *Beems* neither the injurer nor the victim exercised care, and the result unfortunately was the death of the victim.² In the example, like in *Beems*, taking precautions was a discrete choice which would have prevented the accident altogether. But the inefficient equilibrium can arise even if taking precautions is a continuous variable, and even if there always remains a residual risk of an accident.

In this paper we rely on game theory and evolutionary game theory to rigorously analyze situations of alternative care where the injurer is the least cost avoider and the victim is not fully compensated for her losses and discuss possible solutions and policy implications. These situations give rise to two stable Nash equilibria in pure strategies, corresponding to situations in which one party always takes care while the other party never takes care, and one unstable mixed strategy equilibrium in which both parties take care with positive probability.³

The multiplicity of equilibria provides a powerful explanation for a puzzling phenomenon, according to which the same legal rules lead to different patterns of behavior in different countries. The example which opens the paper, of pedestrians being injured by motorists while crossings the street, demonstrates the puzzle: although the relevant liability rule is generally the same in the U.S., Canada, Italy and Israel, namely, the injurer is held liable in case of an accident but the victim is not fully compensated, different patterns of interactions are observed between pedestrians and drivers

in those countries. In particular, while in certain parts of the U.S. and Canada drivers usually stop at zebra stripes letting pedestrians cross the street safely, in both Italy and Israel pedestrians must be much more careful and make sure that the road is clear before crossing.⁴

From a policy perspective, the multiplicity of equilibria and the possibility of an inefficient equilibrium are disturbing and raise an important policy question: Can the legal system induce injurers and victims to "play" the efficient equilibrium? And if so how? The answer is yes. The legal system can play an important role in securing the efficient outcome. The details, however, depend on whether compensation of victims is feasible or not. If it is feasible, full or adequate compensation for victims would eliminate the inefficient equilibrium and make the efficient equilibrium unique, because victims will have no incentive to take care, and therefore injurers will take care. To illustrate, in the example above, if the harm is such that the victim can be adequately compensated, specifically, if compensation is slightly above 60, she would have no incentive to take care (since her costs of care, 40, would be higher than her uncompensated loss). As a result, the injurer would take care and efficiency would be attained. Therefore, contrary to the common view in law and economics, compensation does matter for efficiency.

But more importantly, even if adequate compensation is not feasible, as in wrongful death cases, the legal system can offer several solutions to tackle the multiplicity problem. One solution is to revert to precaution costs liability. Under this rule, the injurer, if he did not take due care, is liable either for the harm, if the victim did not take care and the accident occurred, or for the costs of care incurred by the victim, if the victim took care and the accident was prevented. Precaution costs liability solves the multiple equilibria problem since the injurer's costs of care are lower than the victim's costs of care. However, it might not be practical, because it requires that liability be imposed even when no accident and no harm occur. Another solution is to regulate the behavior of the injurer instead of imposing liability on the consequences of his behavior. Regulation solves the problem, because it induces the injurer to take care regardless of the behavior of the victim. Nevertheless, higher enforcement costs of regulation may render regulation socially undesirable in comparison to tort liability. Yet another solution is to change the nature of the interaction between injurers and victims from a simultaneous interaction to a sequential one with the victims moving first. Altering the nature of the interaction in this way solves the problem because the victim, anticipating that the injurer will take care, will not take care, and the injurer, observing that the victim does not take care, will take care. This solution may be largely impractical, as it is far from trivial to affect the nature of interaction between injurers and victims. However, there is an interesting example, namely, the use of Leading Pedestrian Interval, which gives pedestrians a head start in crossing the street on green light, while delaying for few seconds the green light given to motorists turning right or left, where this solution actually works.

Finally, the legal system can play a key role in promoting efficiency by affecting the dynamic interaction among injurers and

¹ *Beems v. Chicago, Rock Island & Peoria R.R.* 12 N.W. 222 (Iowa 1882).

² In *Beems* the victim, a brakesman, met his death in making an attempt to uncouple a tender from a car. When he went between the cars to uncouple them, the cars were moving at an improper and unusual rate of speed. The injurers, who were negligent in failing to obey a signal to check the speed of the cars, argued that the brakesman's action established contributory negligence. The courts stated that "[the brakesman] was authorized to believe that the motion of the car would be checked, and he was not required to wait, before acting, to discover whether obedience would be given to his signal. The jury could have found that after the signal had been given, and after he had gone between the cars, if their speed had been checked, he would not have been exposed to danger. His act, therefore, in going between the cars after having made the signal to check their speed, was not necessarily contributory negligence. . . ."

³ These situations can be analyzed as an anti-coordination game, like the classical chicken or hawk-dove game, with two distinct populations, namely, injurers and victims (Schelling, 1960; Maynard Smith and Price, 1973; Maynard Smith, 1982).

⁴ There is ample anecdotal evidence that the interaction between motorists and pedestrians at zebra crossings (and elsewhere) has a strategic dimension of the sort we discuss in this paper. See, for example, Howarth (1985). Indeed, Schelling (1960) has already pointed out that the chicken game can describe such an interaction. See also *The New York Times* on Aug 24th, 1993 "Pedestrian Crossing as Game of Chicken" (<http://tinyurl.com/brxav8w>) and on Jan 4th, 1998 "Why Pedestrian Play Chicken to Cross the Road" (<http://tinyurl.com/bvah5cy>). In addition, there is plenty evidence that different pattern of behavior of motorists and pedestrians, sometimes referred to as social norms, emerge in different places. See, for example, on the *Social Evolution Forum*, "Drivers versus Pedestrians: A case study of social norms" (<http://tinyurl.com/bufcuot>). Indeed, in certain places, tourists are urged not to play chicken with drivers.

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