

Michigan Law Review First Impressions

Volume 108

2009

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Recommended Citation

Mark Grady, *Another Theory of Insufficient Activity Levels*, 108 MICH. L. REV. FIRST IMPRESSIONS 30 (2009).
Available at: http://repository.law.umich.edu/mlr_fi/vol108/iss1/14

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ANOTHER THEORY OF INSUFFICIENT ACTIVITY LEVELS

Mark Grady^{*†}

A response to David Gilo & Ehud Guttel, *Negligence and Insufficient Activity: The Missing Paradigm in Torts*, 108 MICH. L. REV. 277 (2009).

INTRODUCTION

Professors David Gilo and Ehud Guttel have written an important article on the tendency of the negligence rule to produce inefficiently low activity levels. In *Negligence and Insufficient Activity: The Missing Paradigm in Torts*, the authors claim insufficient activity to be the “missing paradigm” in tort theory. Although I agree with Gilo and Guttel that this missing paradigm is central to negligence doctrine, I disagree with them about how insufficient activity levels arise.

I. GILO AND GUTTEL’S RELIANCE ON “LUMPY” PRECAUTION

The Gilo-Guttel model is interesting, but it seems out of step with normal economic reasoning. Everything in the authors’ model turns on their assumption that some precaution is lumpy. As that term is commonly used by economists, a “lumpy” asset is also “nondifferentiable” (in the mathematical sense) because it exists in only one relevant quantity and quality. In more common parlance, a lumpy asset is nonscaleable. Gilo and Guttel assume that the railroad has only one spark arrester choice. This spark arrester is so productive that it produces a socially efficient activity level of eight train runs. Nevertheless, the spark arrester is expensive relative to the variable-cost precautions, which are indeed continuously differentiable. These unconventional assumptions move the authors’ model toward a corner solution at which the railroad maximizes its private profits by reducing its activity level to a point at which the lumpy spark arrester just barely fails to pay off (under the Learned Hand formula) and therefore does not need to be installed. This low activity level (five train runs) is well below the social optimum of eight train runs, as the authors stress. In effect, the lumpiness of the spark arrester in combination with the Hand formula yields insufficient activity levels as rational actors seek to avoid a lumpy investment.

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† Suggested citation: Mark Grady, Response, *Another Theory of Insufficient Activity Levels*, 108 MICH. L. REV. FIRST IMPRESSIONS 30 (2009), <http://www.michiganlawreview.org/assets/fi/108/grady.pdf>.

The authors' critical assumption is that spark arresters come in only one grade. If instead spark arresters came in several grades, or even if lumpy spark arresters possessed nonlumpy substitutes, the authors' corner solution would disappear. Because the negligence rule allows injurers to externalize some of the costs of increasing activity levels upon victims, most economists believe that the negligence rule can actually yield economically excessive activity levels. Gilo and Guttel reason that this standard result may not obtain in a model where one precaution lacks continuous differentiability and the other precaution possesses it.

II. IS PRECAUTION LIKELY TO BE LUMPY?

Perhaps economists' assumption that economic functions should be differentiable has led us astray. Gilo and Guttel refer to their lumpy precaution (the spark arrester) as a "fixed-cost" precaution, but we should start with the recognition that it is not a "fixed-cost" precaution in the standard economic sense.

In standard production theory, after a factory has been built, the plant itself is indeed a fixed cost because the owner must pay the mortgage whether production occurs or not. Then, the entrepreneur hires labor, which is a variable cost for two reasons: (1) you need more labor to produce more output; and (2) you can fire labor in the short run. If demand for your product increases, the only way to increase the production in the short run is to hire more labor (the variable-cost resource). Based on this scenario, production theory yields a number of economic lessons and principles, such as the long-run shut-down point, the short-run shut-down point, the decreasing marginal product of labor given a particular factory size, and so forth. Gilo and Guttel fail to stress, however, that economists almost always assume that productive resources are continuously differentiable. Fixed-cost assets are only fixed in the short run, not because they are inherently lumpy, but because the entrepreneur has irrevocably invested in a factory (or other durable asset) of a particular quality and quantity. Gilo and Guttel's model is more extreme in that they assume nondifferentiable costs and assets in the long run.

Economists usually deny that nondifferentiable costs and assets exist. If lumpy resources were common, production theory would be totally different. When I wrote an early article about contributory and comparative negligence, I read a number of spark arrester cases. In Gilo and Guttel's favor, I cannot specifically remember a case in which an issue ever arose about the *quality* of the defendant's spark arrester. Having admitted this, however, I still doubt that spark arresters were the lumpy assets that our authors posit. These cases gave me the impression that part of a spark arrester's cost was the loss of thermodynamic efficiency from placing the spark-catching screen over the train's exhaust. The finer this screen, the more effective but also the more costly the spark arrester became, because the screen made the steam locomotive burn more fuel per mile. Since screen gauge seems continuously differentiable, cost would be too. The railroad

could always increase the gauge of the mesh and thus have a cheaper spark arrester.

Gilo and Guttel's examples from actual cases also fail to show that lumpy precautions are so common that society should be worried about their activity-level-reducing effects. In one case, they describe the supposedly lumpy precaution of noise insulation of machinery. But, might the insulation be thick or thin or placed only on the noisiest machines? In other words, contrary to the authors' model, the cost of this precaution seems fully scaleable. Another case example entails railings on bleachers. Nevertheless, railings can be either numerous or few and either strong or weak. Perhaps the authors' best case example in support of their theory is a bartender that a defendant hotel could have assigned to a private party at which a guest became so drunk that he ran into a tree and hurt himself. Nevertheless, bartenders can work a shift that is focused more or less on hours when heavy drinkers will likely overindulge. Thus, even this best example fails to demonstrate that precaution cost is frequently lumpy.

III. HOW THE NEGLIGENCE SYSTEM CAN ACTUALLY PRODUCE INSUFFICIENT ACTIVITY

I have previously published my own theory about how the negligence rule can yield insufficient activity levels. I posit that precautions can usefully be seen as "durable"—like a fire escape—or "nondurable"—like a fire escape inspection. Despite Gilo and Guttel's suggestion (in their footnote 42), neither of these precautions is a "fixed-cost" precaution in their sense of entailing lumpiness or nondifferentiable cost. In my model, fire escapes come in continuously differentiable grades. They can go up to the top floor or only to the first floor; they can be relatively maintenance-free or the opposite; they can be made of steel or wood, and so forth. In my definition, a "durable" precaution—as its name suggests—lasts a long time. Once you install a fire escape, you typically don't have to install another one soon. Nondurable precaution is the opposite. If you inspect the fire escape this month to see whether the bottom stairway still falls to the ground when loaded with escapees, you might have to do it again in another six months. In fact, reasonable care might require this inspection every month if it is sufficiently cheap and productive. Obviously nondurable precaution also entails variable cost.

As I have previously explained, my reason for the distinction is that courts are highly intolerant of lapses in nondurable precaution—so intolerant that the legal rule governing their use is more like the economist's conception of strict liability than of negligence. Theoretically, if you forget to install a fire escape, courts would be equally intolerant, but one could say—quite accurately—that the "opportunity set" for judicial intolerance is greater the more often a precaution has to be remembered and therefore may not be remembered. Thus, as a practical matter, durable precautions are covered by the rule economists know as the Hand formula; whereas nondurable precautions are covered by a stricter liability rule, which only lawyers and

judges know as “negligence” and which economists would likely call “strict liability,” if they knew more about it.

It is relatively easy to comply with the Hand formula, which applies most directly to durable precautions. You need only use cost-beneficial precaution. It can be very hard—often totally uneconomic—to comply with the corresponding legal rule that applies to nondurable precautions. This rule requires one to remember every single (reasonable) inspection at its appointed time.

It follows that most negligent behavior experienced in the real world will entail lapses in nondurable precaution. Given the harshness of the negligence rule, it is often efficient for people to be negligent, as I have also pointed out previously. Consider a surgeon who vows to count every single sponge before she closes her patients in each of the thousands of surgeries that she conducts over her lifetime. Although this (hypothetical) surgeon might be the only one who has fully complied with the negligence standard, it is unlikely that this surgeon has been “efficient.” That is why most negligence in the operating room is a lapse in a nondurable precaution as opposed to a failure to install a durable precaution such as medical equipment of the proper quality.

This analysis reveals a deep paradox in the civil liability system. The rate of negligence in the economy will be directly proportionate to the productivity of nondurable precaution. Moreover, basic safety technology—such as the invention of the dialysis machine for kidney failure, the invention of the air brake for trains, or even the invention of the surgical technique for doing appendectomies for the first time—will almost always *increase*, not decrease, the productivity of complementary nondurable precaution. Here then is the paradox: basic safety technology often increases the rate and amount of negligent behavior. When you install air brakes, you now can be negligent in ways that simply did not exist before. Your engineer has to keep better lookouts (which were relatively useless before brakes) and your brakepeople have to inspect the brakes constantly, which of course they didn’t have to do at all before airbrakes were invented.

Having heard the foregoing reasoning, many people initially suspect that this problem must be the result of “judicial error.” It is not. Instead, the problem has to do with real and unavoidable judicial measurement costs. Courts cannot easily assess whether a given surgeon has been counting sponges at an efficiently high rate or at an inefficiently low rate or whether a particular lapse fell in the efficient zone or in the inefficient zone. Instead, because of these substantial and real measurement costs, courts either make surgeons liable for all lapses or else—a modern trend—give juries the power to absolve some surgical lapses more or less randomly. This absolution, however, comes only after the erring surgeon has incurred substantial costs to fight the case against her. Indeed, the modern trend of allowing jury absolution, while not much noted in the economic literature, may respond to the “problem” of what I have recently called “compliance-using” technology—that is, modern technology that requires high rates of nondurable precaution.

Strict liability for lapses in nondurable precautions can easily cause inefficiently low activity levels, as I have also argued before in articles cited by Gilo and Guttel. The problem is most acute where the plaintiff and the defendant have a contractual relationship. Consider the invention of the first high-tech incubator for extremely premature babies. Although this early incubator may have yielded many pediatric miracles, it was probably unforgiving of human error. In other words, it radically increased the productivity of nondurable precaution by nurses and other pediatric ward technicians. In fact, an early but ambitious incubator probably required constant attention of a type that led to many outstanding negligence cases against the medical personnel who all too predictably failed to achieve the perfection that the negligence rule requires. Although parents of lost babies possessed strong negligence cases for the nurses' and technicians' lapses in nondurable precaution, they (or someone) paid upfront for the liability. Because, moreover, the subsequent liability did not truly compensate the parents for their lost babies—a damages award can only compensate for a financial loss—the upfront liability premium was a poor ex ante deal for the parents. In addition, tort liability has high administrative costs, which also need to be recovered ex ante by efficiently run hospitals. As a consequence, these parents (or their insurance companies), through their unwillingness to pay the ex ante liability premiums that were needed to pay them ex post for efficient negligence, probably reduced their demands for incubation to lower levels, maybe “insufficient” levels. (There is a “Nirvana-fallacy” problem here, but that is a second-order question, which I do not have the space to discuss.)

Here is another example: when airbag technology was first invented, the automobile companies claimed that it was ineffective. They could have been saying that consumers were unwilling to pay the ex ante liability premiums for early but ambitious technology that probably would have required many nondurable precautions by manufacturers and dealers to manufacture and to maintain. If this is correct, then this technology was probably not introduced swiftly enough to satisfy at least the most formal notions of economic efficiency even when the delay could have been a rational response by automobile manufacturers to the actual legal rule that punishes every lapse in a nondurable precaution, efficient as well as inefficient lapses. Think of the business case that would be made against the early introduction of airbag technology that would have saved many lives at low cost but which would have also generated large liability awards for efficient manufacturing and servicing lapses in nondurable precaution.

Another paradox is that the problem of insufficient activity should be *less* severe in noncontractual scenarios, which is maybe why we see an unusually constrained type of negligence rule in many *contractual* settings, such as *Winterbottom v. Wright*, to pick an early case. To see this point, think of *United States v. Carroll Towing Co.*, the most important negligence case of the legal economist's canon. The case arose only because the plaintiff's bargee was not on the scene to correct for the defendants' prior negligence of tying the plaintiffs' barges lines too loosely after the defendants had freed another barge in order to move it. Tying lines is, of course, a

nondurable precaution, and the defendants lapsed on this one occasion and were liable jointly with the barge owner—the plaintiff. The harbormaster’s one failure among (probably) tens of thousands of successful knots led Judge Hand to the conclusion that the harbormaster had been negligent in the most obvious way. Judge Hand did not even launch his formula against this issue of the *defendants’* negligence, because the proper legal conclusion was so clear to him. Here is the legal principle that was so obvious to Judge Hand: strict liability exists for a defendant’s lapse in nondurable precaution. You might think that someone strictly liable for tying lines would inefficiently reduce their activity. Nevertheless, the plaintiff—the barge owner—was a contractual stranger to the defendants, and the defendants therefore were *not* in a position to charge the plaintiff an *ex ante* liability premium that might have reduced the activity of line-tying (in the same way that the activity of incubation can be reduced by a lack of demand for legal liability among parents of premature babies or their insurance companies).

Even if no contractual conduit exists between a plaintiff and a defendant, you still might think that strict liability for common lapses could reduce activity levels, and it probably does so to some extent. The administrative costs from using the courts to punish efficient lapses could yield this result. Nevertheless, plaintiffs (and even third parties) possess important, though little noticed, obligations to use more precaution because they have seen or should have anticipated someone else’s possibly efficient lapse in nondurable precaution. Thus, in an ideal world, when the harbormaster has entered the truly costly zone of 99.9999999 percent perfection in tying lines and has then efficiently lapsed, the plaintiff will respond by using the simple “corrective” precaution of noticing that the line has not been tied properly or staying on the barge during working hours and avoid the occasion for a lawsuit and its administrative expense. This incentive created by the doctrines of contributory and comparative negligence thus reduces the administrative costs of litigating over efficient lapses and correspondingly increases activity levels. In fact, you could easily regard the wish to preserve this incentive as the real justification for Judge Hand’s ruling in the *Carroll Towing* case. He gave the following as his reason for why it was negligent for the plaintiff’s bargee to have been absent:

Certainly it was not beyond reasonable expectation that, with the inevitable haste and bustle [in the wartime New York harbor], the work [of line tying] might not be done with adequate care. In such circumstances we hold—and it is all that we do hold—that it was a fair requirement that the Connors Company [the plaintiff] should have a bargee aboard (unless he had some excuse for his absence), during the working hours of daylight.

In this most famous of all negligence cases, Judge Hand’s formula imposed an obligation on victims to correct for the prior actual or anticipated negligence of injurers in order to help sustain efficient activity levels in the maritime industry.

In conclusion, I commend the authors for tackling such an important problem and join with them in hoping that their stress and analysis of insufficient activity levels will lead to a new paradigm of tort liability.