The Gun and the Paperweight: Risk Control Services and Disservices

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Abstract: Suppose a legal rule makes it negligent to have a loaded gun out in the open in a place of business. Should a defendant who violated this rule by using a loaded gun as a paperweight be liable for his client’s broken toes when the gun falls onto her foot? Problems manifesting this basic structure have occupied scholars and Restatement reporters for decades. In this essay, I reframe untaken precautions as a bundle of risk control services, each of which counteracts a particular risky element, like “shooting capacity” or “heaviness” in the case of the gun. Tort law ought to induce actors to produce all, and only, the risk control services that are worth the cost of providing. Cashing out that prescription is tricky because precautions often jointly provide multiple risk mitigation services, and more than one precaution may meet the legal standard. Nonetheless, the task becomes tractable if we examine the cost structure of precautions — and, analogizing to break-even analysis for products, identify which risk control services contribute to rather than detract from a precaution’s bottom line. The risk services framework partially redeems but also revises harm-within-the-risk and negligence per se doctrines that limit negligence liability based on the type of danger or category of victim involved in a given accident. By enabling us to assess which ostensible risk control services are really societal disservices, this approach provides a firmer basis for calibrating the scope of liability.

Keywords: harm within the risk, negligence per se, causation, precaution, deterrence, corrective justice

For helpful questions, comments, and conversations, I thank Lawrence Alexander, Sadie Blanchard, Samuel Bray, Mark Grady, William Hubbard, Gregory Keating, Daniel Kelly, Maria Maciá, Richard McAdams, Ariel Porat, Spencer Smith, Jay Tidmarsh, an anonymous reviewer, and participants in the 2022 Midwestern Law and Economics Association Meeting, a faculty workshop at the University of Chicago Law School, and a Private Law seminar at Notre Dame Law School. Remy Merritt and Matt Maxson provided excellent research assistance. Research support from the Harold J. Green Faculty Fund is also gratefully acknowledged.

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Duncan, an accountant, uses a loaded gun as a paperweight in his messy office. While his client, Petra, is meeting with him to go over her taxes, she accidentally dislodges the gun from its resting place and it falls on her foot, breaking two of her toes. The gun does not discharge. A legal rule in this jurisdiction makes it negligent to have a loaded gun lying out in the open in a place of business.\(^1\) There is every indication that this rule was meant to address the risk of a shooting, not to protect toes from falling objects. Should Duncan be liable to Petra?

Problems manifesting this basic structure have occupied scholars and Restatement reporters for decades.\(^2\) In this essay, I reframe untaken precautions as a bundle of risk control services, each of which counteracts or neutralizes a particular risky element, like “shooting capacity” or “heaviness” in the case of the gun. Negligence law ought to induce actors to produce all, and only, the risk control services that are worth the cost of providing.\(^3\) Cashing out that prescription is tricky because precautions often jointly provide multiple risk mitigation services, and more than one precaution may meet the legal standard. Nonetheless, the task becomes tractable if we examine the cost structure of precautions — and, analogizing to break-even analysis for product lines, identify which risk control services contribute to rather than detract from a precaution’s bottom line.

Resolving the gun-and-paperweight conundrum carries broader implications for core aspects of tort law and risk regulation. I extend the analysis to other contexts where precautions deliver risk control services that reach different groups

\(^{1}\) This might be due to a statute, the violation of which is treated as negligence per se, or it might be due to a jurisdiction’s common law negligence rule. See Ariel Porat, Expanding Liability for Negligence Per Se, 44 Wake Forest L. Rev. 979, 980–81 (2009) (observing that normative arguments applicable to negligence per se can be extended to common law negligence).

\(^{2}\) See, e.g., Restatement (Third) of Torts: Liability for Physical and Emotional Harm § 29 cmt. d, illus. 3 (Am. L. Inst. 2010) (hunter negligently gives a loaded gun to a child who drops it on her foot; injury deemed not to fall within the scope of liability); Eric A. Johnson, Wrongful-Aspect Overdetermination: The Scope-of-the-Risk Requirement in Drunk-Driving Homicide, 46 Conn. L. Rev. 601, 613–15 (2013) (discussing the gun-breaks-toe example and observing that variations of it appeared in both the Second and Third Restatements); Israel Gilead & Michael D. Green, Positive Externalities and the Economics of Proximate Cause, 74 Wash. & Lee L. Rev. 1517, 1539 n.83, 1539–41 (2017) (discussing this “gun illustration” and attributing it to Charles E. Carpenter, Workable Rules for Determining Proximate Cause, 20 Cal. L. Rev. 229, 231 (1932)).

\(^{3}\) This claim follows from a law and economics perspective in which the costs that society seeks to minimize include the costs of preventing accidents. See generally Guido Calabresi, The Costs of Accidents (1970). Some normative frameworks would not treat all these costs as fungible. Cf. Gregory C. Keating, Is Cost-Benefit Analysis the Only Game in Town?, 91 S. Cal. L. Rev. 195, 217–18 (2018) (arguing that cost-benefit analysis assumes a symmetry between harm and benefits that is “at odds with our ordinary intuitions and our law”). Calabresi’s approach also includes administrative costs, see Calabresi, supra, at 26–31, which are discussed further below. See infra Part 5.2.2.
or address different dangers than those central to a precaution’s primary justification. A risk services perspective partially redeems but also revises legal doctrines that have traditionally limited the scope of negligence liability in such circumstances. By enabling us to assess which ostensible risk control services are really disservices, this approach provides a firmer basis for calibrating the scope of liability.

Part 1 begins with the doctrinal treatment of situations like Duncan’s, as well as some academic critiques of that approach. Part 2 presents the risk control services framework, which analogizes precautions to product lines, and tests it out on the gun and paperweight case. Part 3 applies the framework to rules designed to protect particular groups of potential victims, and Part 4 takes on some other famous examples. Part 5 turns explicitly to the question of whether this analysis justifies limiting the scope of liability, and addresses some objections. Although my approach is grounded in a law and economics perspective, I also discuss how corrective justice considerations bear on the normative assessment.

Notably, my analysis addresses only one possible rationale for limiting the scope of liability: that a harm, despite being foreseeably caused by the defendant’s failure to implement a cost-effective precaution, did not flow from the type of risk the defendant was obligated to mitigate. I assume that other grounds for limiting liability, such as foreseeability or intervening acts, continue to operate independent of the framework I develop here. I also take as given certain (debatable) features of our existing tort regime, including the existence of categorical negligence per se rules and their common law equivalents rather than a fully

4 These doctrines are often treated as part of the proximate cause inquiry, which pares down the set of harms caused in a but-for sense by the defendant’s tortious acts to those for which she will be held legally responsible. See, e.g., Porat, supra note 1, at 980–81. But it is possible to frame the inquiry as one about factual or “but-for” causation if the focus is not on whether the act caused the injury, but rather on whether the wrongful aspect of the act caused the injury. See, e.g., Robert Keeton, Legal Cause in the Law of Torts 13 (1963) (observing that the rule limiting the risks for which a defendant will be responsible “concerns cause-in-fact relation between the negligent aspect of the conduct and the harm”); Jane Stapleton, The Risk Architecture of the Restatement (Third) of Torts, 44 Wake Forest L. Rev. 1309, 1322–24 (2009) (discussing the gun-breaks-toe example and observing that it implicates factual cause if we focus on the gun’s “loadedness” as the “tortious aspect”).

5 See Gregory C. Keating, The Priority of Respect Over Repair, 18 Legal Theory 293, 295–97 (2012) (contrasting the incentive-based orientation of legal economics, with its focus on avoiding future harm, with the concern of corrective justice for identifying and redressing past wrongs).

A customized approach to negligence, and the use of actual harm rather than the creation of risk as the trigger for liability.7

1 The Doctrinal Answer and its Discontents

The doctrinal answer to Petra’s complaint is straightforward. Because toe-crushing injuries are not the sort of risk that made having a loaded gun on the desk negligent, she cannot claim the benefit of that legal conclusion. In tort-speak, the harm is not “within the risk.”8 The Third Restatement puts it this way: “An actor’s liability is limited to those harms that result from the risks that made the actor’s conduct tortious.”9 Another provision elucidates the situation for acts that are, by statute, negligent per se: “An actor is negligent if, without excuse, the actor violates a statute that is designed to protect against the type of accident the actor’s conduct causes, and if the accident victim is within the class of persons the statute is designed to protect.”10

Petra can, of course, still try to argue that it was negligent to keep any heavy object on the desk, or that it was negligent for Duncan to invite Petra to sort through papers at his desk while any such object was precariously balanced there, or that it was negligent for Duncan to have positioned guest chairs for his clients so close to the desk’s “fall zone” given that he did have heavy objects on his desk, or some combination of the above. But let’s imagine Duncan was exercising due care when he chose to put heavy objects on his desk, when he located the guest chairs as he did, and when he handed Petra the paperwork that she was sorting through at the time of the accident. If her injury had been caused by a paperweight, and not a gun, let’s assume, Duncan would have been in the clear. This centers our inquiry on the relevant question: Does it matter to Duncan’s liability that it was a gun and not merely an equally heavy paperweight?

7 See, e.g., ARIEL PORAT & ALEX STEIN, TORT LIABILITY UNDER UNCERTAINTY 103–10 (2001) (contrasting tort law’s harm-based liability approach from one based on risk); infra note 55 and accompanying text (discussing the possibility of more personalized alternative approaches).
8 See, e.g., KEETON, supra note 4, at 10 (explaining that one formulation of the limitation on liability “is often expressed in the statement that the actor is responsible only for ‘results within the risk’”). There are many variants in phraseology as well as numerous alternative tests that get at this question of scope in slightly different ways. See, e.g., id. at 3–18 (discussing three different formulations of the “Risk Rule”); RESTATEMENT (THIRD) OF TORTS: LIABILITY FOR PHYSICAL AND EMOTIONAL HARM § 29 cmt. d (AM. L. INST. 2010) (observing that this limitation “is often referred to as the requirement that the harm be ‘within the scope of the risk,’ or some similar phrase,” and adopting the shorthand of “risk standard”); Richard W. Wright, Causation in Tort Law, 73 CAL. L. REV. 1735 (1985) (surveying and comparing various approaches to questions of scope of causation, including Keeton’s “harm within the risk” theory and the “tortious aspect” approach).
9 RESTATEMENT (THIRD) OF TORTS: LIABILITY FOR PHYSICAL AND EMOTIONAL HARM § 29 (AM. L. INST. 2010).
10 Id. at § 14.
The doctrinal negative answer makes a certain amount of sense. If different sorts of heavy objects present equivalent risks as to their heaviness, why should we distort people’s choices among them by allowing risks generated by heaviness embodied in gun form to be treated differently from heaviness embodied in, say, “decorative brick” form or “interesting rock” form? It is the extra risk associated with the shooting potential that we’re after, the very thing that made the loaded gun on the desk negligent. If the shooting attribute is removed, a gun is effectively a gun-shaped paperweight. Why, then, should we treat it differently from an actual paperweight? On this account, Duncan may have acted negligently by having the loaded gun out on his desk, but the harm it caused Petra did not relate to the risks that made his behavior negligent, so he is not liable. This is a clear answer, with some intuitive support, but does it really stand up to scrutiny?

There’s some reason for doubt. The harm-within-the-risk analysis upon which this “no liability” conclusion relies has come in for heavy criticism. Heidi Hurd and Michael Moore claim it “is conceptually incoherent, normatively undesirable, and… gives an inaccurate description of the decided cases.” Robert Cooter and Ariel Porat argue on economic grounds against such a curtailment of liability. Porat has written separately to criticize the doctrinal position on negligence per se, which restricts recovery to those risks and classes of persons the statute meant to address.

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11 To be sure, even an unloaded gun seems inherently more intimidating than most paperweights. Here, I omit the gun’s intimidation potential for expositional simplicity, and assume Petra did not suffer any harm as a result of this factor. We can specify additional facts to make this clear: Petra didn’t notice the gun or see it falling until after it struck her toes. In other words, the harm to Petra came from a risk that was common to all paperweights. I also set aside the possibility that Duncan may have derived pleasure from the gun’s intimidation potential when he chose to use it, rather than some other object, as a paperweight. Because intimidation is parasitic on the shooting risk that Duncan was unquestionably obligated to control, any extra benefits it provided should not be factored in when considering the value of the gun’s functionality as a paperweight.

12 This requirement is sometimes framed in terms of the “wrongful aspect” or “tortious aspect” of the conduct. See Wright, supra note 8, at 1766–74 (describing and assessing this standard, and applying it to cases like the gun-breaks-toe scenario).

13 See, e.g., ROBERT D. COOTER & ARIEL PORAT, GETTING INCENTIVES RIGHT: IMPROVING TORTS, CONTRACTS, AND RESTITUTION 47–60 (2014) (analyzing negligence per se and related common law doctrines limiting liability based on the type of risk that eventuated in harm); Hurd & Moore, supra note 6 (analyzing and rejecting the harm-within-the-risk doctrine, which would limit the kinds of harms for which a negligent defendant is liable); Porat, supra note 1 (critiquing the limits on liability built into the negligence per se doctrine).

14 Hurd & Moore, supra note 6, at 411.

15 COOTER & PORAT, supra note 13, at 47–60; see also Porat, Misalignments in Tort Law, 121 YALE L.J. 82, 126, 126 n.127 (2011) (disagreeing with the limitation of liability result in the canonical gun-breaks-toe example).

16 Porat, supra note 1.
These critics argue that limiting liability in these ways arbitrarily cuts some factors out of the negligence equation that may in fact have contributed to the cost-effectiveness of the precaution the defendant omitted, or to the wrongfulness of her omitting it. Unable to identify any reasoned basis for a harm-within-the-risk rule to truncate an all-inclusive consideration of costs and benefits, Hurd and Moore urge abandonment of the approach.\textsuperscript{17} Cooter and Porat maintain that liability should follow, \textit{contra} the common law and negligence per se limits, as long as the negligent act foreseeably increased the risk of the type of harm that actually occurred.\textsuperscript{18}

I take a different tack here. Resolving cases like Petra’s requires isolating the risk control services that the defendant was in a position to cost-effectively provide. That, in turn, requires confronting the cost structure of the bundled risk control services that a given precaution delivers. Neither the doctrinal approach nor existing critiques of it grapple adequately with this issue. However, ideas borrowed from the break-even analysis of product lines can help us gain traction on it.

2 Precautions and Product Lines

As Mark Grady has emphasized, real-world negligence determinations typically focus on untaken precautions.\textsuperscript{19} A plaintiff will strive to identify a precaution that would have prevented her accident and that also would have been cost-effective for the defendant to undertake — in Petra’s case, stowing the gun.\textsuperscript{20} Obviously, Duncan might have taken a different precaution, unloading the gun, that would \textit{not} have prevented Petra’s accident. Had he actually done so, he would have avoided liability. Yet it is up to the plaintiff to identify the untaken precaution, and problematic to let a defendant who took no precaution at all specify which cost-justified precaution he “would have” taken.\textsuperscript{21} Injurers could then tailor their

\textsuperscript{17} Hurd & Moore, \textit{supra} note 6, at 365–74.
\textsuperscript{18} \textsc{Cooter & Porat, supra} note 13, at 54–55; see also Eric A. Johnson, \textit{Dividing Risks: Toward a Determinate Test of Proximate Cause}, 2021 U. ILL. L. REV. 925, 950–66 (2021) (urging consideration of the risk profile of each branching course of events set in motion by the defendant’s negligent act).
\textsuperscript{19} Mark F. Grady, \textit{Untaken Precautions}, 18 J. LEGAL STUD. 139 (1989).
\textsuperscript{20} See id. at 150 (noting the tension between these two requirements, given that a more “trivial failing” is more likely to be cost-effective but less likely to have prevented the accident).
\textsuperscript{21} See id. at 144 (“[B]y selecting an untaken precaution on which to rely, the plaintiff defines the analysis that everyone else will use — including the defendant, the court that will try the case, and any court that may hear an appeal.”); Lee Anne Fennell, \textit{Accidents and Aggregates}, 59 WM. & MARY L. REV. 2371, 2420–21 (2018) (noting the problem of allowing the defendant to specify the untaken precaution, where no precaution at all was taken). For discussion of a related problem, setting the baseline for assessing damages where it is clear that the defendant breached a duty that could have
untaken precautions to strategically dodge liability for negligently caused accidents.\textsuperscript{22}

Allowing the plaintiff to select the omitted precaution, subject to the twin requirements of causal efficacy and cost effectiveness, sidesteps that concern. However, difficulties emerge when that omitted precaution would have counteracted multiple risks, not all of which were necessarily worth the cost of mitigating. A finding of negligence suggests that in the aggregate, the gains in risk reduction associated with an omitted precaution were more socially valuable than the costs of taking that precaution.\textsuperscript{23} But this tells us nothing about which risk control services contributed to or detracted from the precaution’s overall cost effectiveness — a question we need to answer in order to correctly respond to an injury like Petra’s.\textsuperscript{24} Casting risk control services as products, and precautions as technologies for producing a product line, helps us do just that.

2.1 The Contribution Margin

We can start by considering the cost structure for ordinary products, and then turn to the risk control products that precautions fabricate.

\footnotesize{been fulfilled in different ways, see Michael G. Pratt, \textit{What Would the Defendant Have Done but for the Wrong?}, 40 \textit{Oxford J. Legal Stud.} 28 (2020).

\textsuperscript{22} See Fennell, \textit{supra} note 21, at 2420–21 (discussing these strategic possibilities); see also Haft v. Lone Palm Hotel, 478 P.2d 465, 472–77 (Cal. 1970) (shifting burden to defendant to show that lack of a lifeguard did not cause drowning, where the statutory obligation could have been met through the alternative means of posting a “no lifeguard” sign).

\textsuperscript{23} This is what the Hand Formula implies. See United States v. Carroll Towing Co., 159 F.2d 169, 173 (2d Cir. 1947) (articulating a formula that deems a defendant to be negligent for not taking a precaution if the burden of doing so (B) was less than the expected probability of injury (P) multiplied by the expected magnitude of loss (L)).

\textsuperscript{24} The distinction that Eric Johnson draws between “determinative” and “non-determinative” risks seems at first to be addressed to this question. See Johnson, \textit{supra} note 2, at 614 (arguing that the victim’s “broken toe [in the Third Restatement’s example] does not satisfy the... requirement that the victim’s injury result from those ex ante risks by virtue of which the conduct’s aggregate risks outweighed its aggregate benefits”). Johnson goes on, however, to explain the distinction in a manner that turns on the capacity of an alternative precaution — unloading the gun, in the famous broken-toe example — to allow the accident to happen without wrongdoing on the part of the defendant. See \textit{id.} at 614–17. My approach does not depend on this kind of separability. See \textit{infra} Part 2.2.2.}
2.1.1 Assessing Product Profitability

Products have fixed costs like factories and machinery that are incurred once and for all, as well as variable costs that vary by the amount of the particular good or service produced. For any given product, it is possible to calculate the extent to which each unit generates revenue in excess of the variable costs associated with making that unit. This figure is the contribution margin, so called because it measures how much a given product can contribute to covering the fixed costs of the operation.25

For manufacturers, a high contribution margin is good: it means the product is significantly exceeding its variable costs and contributing a lot towards covering the fixed costs of the product line. Conversely, a low contribution margin means that the product can contribute relatively little to the fixed costs of production — though it still may be worthwhile to produce.26 A product with a negative contribution margin, however, falls short of covering its own variable costs and actually eats away at the capacity of other products to cover costs.27 Such a product should be eliminated unless there is some way to lower its variable costs or otherwise make it more profitable.28

Not every aspect of the contribution margin analysis maps cleanly onto tort precautions. But the parallel spotlights — and helps us avoid in the tort context — two kinds of errors. The first error would be to demand that each product generate enough revenue on its own to cover the full costs of producing it. In fact, products can be profitably priced below the average cost of production where there are fixed costs that also support other products.29 Thomas Nagle and Reed Holden give the example of airlines who produce “weekend flights that do not cover a proportionate share of capital costs for the plane and ground facilities.”30 This is just another way of saying that not all products must bear the same share of the fixed costs or have the same contribution margin. Whether a product’s per-unit revenue exceeds its marginal costs of production by a lot or a little, we can still classify it as a net contributor to the product line’s profitability.

25 See, e.g., THOMAS T. NAGLE & REED K. HOLDEN, THE STRATEGY AND TACTICS OF PRICING: A GUIDE TO PROFITABLE DECISION MAKING 30–31 (3d ed. 2002) (“The share of the price that adds to profit, the contribution margin, is everything above the share required to cover the incremental, variable cost of the sale.”).
27 See id. (“If a product’s contribution margin is negative, the company is losing money with each unit it produces, and it should either drop the product or increase prices.”).
28 See id.
29 See NAGLE & HOLDEN, supra note 25, at 20 (observing that “[s]cores of companies profit from products that they price below average cost when average cost includes fixed costs that are not true costs of sales”).
30 Id.
The second kind of error that a contribution margin analysis flags seems almost too obvious to state: we cannot conclude from the fact that a product generates some revenue and is part of a product line that is profitable overall, that it is worth making. If the product is generating less revenue per unit than its marginal costs of production, it has a negative contribution margin and should not be made. Although the product still brings in some money, it is actually eroding the profits of the product line, even if the product line remains profitable as a whole.

2.1.2 Risk Control Products

The risk reduction services generated by precautions don’t raise revenue, but they do (or at least should) produce societal benefits that can be compared to their costs of production. Just as individual products in a given product line vary in their profitability for a given company, so too might a precaution generate more and less worthwhile risk mitigation services. Some risk control services generate net benefits that, in expectation, do a lot to help justify a given precaution, while others do less, but still make positive contributions. Others contribute nothing, or actually make the precaution more socially costly to provide. We can use the labels of contributors, washes, and eroders to designate these respective categories of risk control services.

The guiding principle is easy to state in the abstract: actors are negligent only when they fail to provide a risk control service that counts as a contributor to a precaution’s justification, and not when they fail to provide a risk control service that is an eroder or a wash. Applying this rule is less straightforward than stating it, not only because of imperfect information about actual costs and benefits, but also due to conceptual difficulties in categorizing the costs associated with intangible risk control services and in defining the risk control products under consideration. Nonetheless, we can give the framework a test run by returning to the Duncan–Petra saga.

2.2 Duncan’s Untaken Precaution

Consider the precaution, omitted by Duncan, of stowing the loaded gun. This step would have simultaneously mitigated two kinds of risk: that the gun would discharge (shooting risk), and that it would cause injury as a heavy object (crushing risk). In effect, the stowing precaution concurrently fabricates two risk control products — call them “antishoot” and “anticrush.” Stowing is, let’s assume, cost justified in the sense that its total costs are exceeded by the sum of the

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31 The obvious alternative precaution mentioned above, unloading the gun, is further considered below.
antishoot and anticrush benefits. This need not imply, however, that both of these risk control products are worth producing, or that Duncan is obliged to provide both of them to Petra. Analogizing to contribution margin analysis, we can assess whether each service adds to or detracts from the case for stowing the gun — in other words, whether it counts as an eroder or a contributor vis à vis the precaution’s bottom line.

2.2.1 Assessing the Risk Control Products

We can think of our risk control products, antishoot and anticrush, as comprising a small product line. This product line is fabricated through a shared technology: the precaution of stowing the gun. That precaution’s costs include the one-time effort required to physically put the gun away, and a variety of ongoing costs associated with storing the gun and not having it handy on the desk’s surface. The dichotomy between fixed and variable costs used in the contribution margin analysis is not a perfect fit in this context, but we can use a functionally equivalent dichotomy: between costs that are common to the production of both services, and those that are attributable to the production of only one or the other.

The stowing effort itself, which has a fixed-cost quality, clearly falls into the common cost category. So too, however, do the variable costs associated with storing the gun for whatever length of time it is put away. Moment by moment, the gun is taking up real estate in a drawer that might otherwise be occupied by something else that Duncan would like to stow, such as a fifth of whiskey or a personal journal. These variable costs are common to both of the products in the line; the drawer is like a piece of shared machinery that jointly produces anticrush and antishoot for so long as the gun is stowed.

There are also variable costs uniquely attributable to each of these risk control products. Because antishoot and anticrush are provided over time, we can conceptualize them as doses of risk control that roll continually off the assembly line for each interval that the gun remains stowed, leaving a string of opportunity costs in their wake. Each dose of antishoot comes at the price of making it harder for Duncan to fire the gun for legitimate purposes. And each dose of anticrush costs something as well: the forgone convenience of having a heavy object around to weigh down papers. Because heaviness has positive utility (as evidenced by the existence of paperweights) each moment that the gun is put away generates a stream of inconvenience in the form of flyaway papers.

32 The risk control services provided by a given precaution could be divided up in any number of other ways. Below, I will revisit this question of product definition. See infra Part 2.2.2.
Breaking down the costs in this manner enables us to get at the question critical to assessing Duncan’s liability: whether anticrush, as well as antishoot, is worth producing. Does the risk reduction service of disabling the gun’s attribute of heaviness exceed its costs for each unit of time that the gun is put away, or do these costs overwhelm the benefits? We might reasonably suspect the latter, given that (we have posited) there is no negligence associated with having heavy objects out on the desk in general. If so, the production of anti-heaviness services is a loser for the “putting away” precaution, one that detracts from rather than augments the efficiency of stowing the firearm.

There is another possibility. Maybe putting away heavy objects does generate benefits in excess of the variable costs of inconvenience, but the contribution margin is very small, so that without the huge boost from antishoot, the fixed cost of putting away the gun would not be worth incurring. Indeed, it could even be the case that the shooting risk is not significant enough on its own to justify the putting-away effort without the heaviness mitigation to help make the case. But if it were actually true that the benefits of putting away heavy objects exceed the variable costs by even a thin margin, eventually we would reach the break-even point where an object has been off the desk long enough to cover the fixed cost of putting it away (or, perhaps, the cost of never acquiring it in the first place). That paperweights on desks are not generally considered negligent, even when left there interminably, is telling. And shooting risks are large enough to plausibly constitute the whole reason that the loaded gun on the desk is negligent, without any need for help from other quarters.

Another way to frame the question is to ask whether the risk control service in question would have been socially valuable if the common costs of providing it were completely free, or whether it would be more appropriately classified as a

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33 Cf. Porat, supra note 1, at 980.

34 One might question how much information we can derive from this observation, given negligence law’s notorious insensitivity to activity levels. See, e.g., Steven Shavell, Economic Analysis of Accident Law 21–26 (1987). The usual activity level critique focuses on an injurer’s ability to avoid liability if she always takes due care, even though elevated levels of activity increase the number of accidents that will occur even when due care is taken. See id. at 23–25. Break-even analysis of the sort embodied in the Hand formula, by contrast, is directed at determining whether the actor has taken due care. This inquiry should be sensitive to whether the cumulative risk is large enough to cover the fixed costs of a precaution, which will often depend on activity levels. For this reason, reducing one’s activity level could potentially keep a given precaution from being cost-justified, and hence shield an injurer from liability for omitting it. See David Gilo & Ehud Guttel, Negligence and Insufficient Activity: The Missing Paradigm in Torts, 108 Mich. L. Rev. 277, 280–81 (2009). By the same token, a higher level of activity could generate enough cumulative risk to justify a costlier precaution, and generate liability for its omission.
disservice. Would we want the Duncans of the world to produce anticrush as well as antishoot, or is anticrush a kind of waste material we’d be better off without? The answer is clear, if we assume that heaviness is more valuable moment by moment than the risks it presents, as evidenced by the nonnegligence of paperweights. Anticrush is a losing proposition that does not help justify the putting-away cost, and we tolerate it only as a regrettable by-product of the valuable antishoot services.

In the terminology introduced earlier, then, anticrush looks like an eroder. We can then readily infer from the legal rule’s posited overall cost-effectiveness that antishoot is a contributor — and on the analysis provided here, the sole (positive) contributor to the stowing precaution’s bottom line.

2.2.2 Implications and Complications

If it is true that heaviness mitigation is an unwanted and costly aspect of the bundled precaution of putting the gun away, so what? One answer is that we would want to encourage efforts to find better precautions, ones that surgically mitigate the risks that can be cost effectively reduced without touching other risks that are better left in place (given the costs of reducing them). Here, the shooting risk can be successfully addressed on its own through a likely less costly precaution: unloading the gun. But even if such an option were unavailable or too expensive to pursue, it would still make little sense to view an actor as negligent for not controlling a risk that society would be better off leaving uncontrolled. Risk reduction services that have a negative contribution margin are societal disservices, even when they are part of precautionary bundles that are cost justified overall.

Some costs of this nature are unavoidable. Precautions act as bundling devices and cannot split up risk control by infinitely fine degrees. We might observe, for example, that disabling the shooting potential of the gun is not always cost justified. Perhaps a rabid dog is attacking one of Duncan’s clients. If “reducing shooting risk while a rabid dog is in the office” were a separate risk mitigation

35 See infra Part 5.3.2.
36 See Johnson, supra note 2, at 614–15 (observing that precautions “eliminate great lumps of similar outcomes” all at once, and giving the example of simultaneously eliminating a limitless variety of different shooting risks when a gun is unloaded); see also Lee Anne Fennell, Slices and Lumps: Division and Aggregation in Law and Life 222–26 (2019) (discussing the ways in which durable precautions bundle together different risk scenarios); Mark F. Grady, Marginal Causation and Injurer Shirking, 7 J. Tort L. 1, 26 (2014) (noting that “durable precautions frequently aggregate over multiple potential plaintiffs”).

Electronic copy available at: https://ssrn.com/abstract=4242348
product, Duncan would not be obligated to supply it.\textsuperscript{37} When we say that disabling the shooting potential produces a large surplus of benefits over costs, that statement embeds countless possible scenarios (sub-products, in a sense) most of which reflect that pattern of costs and benefits, but some of which do not, and that thereby erode the overall surplus that the risk reduction service provides. How then should we define the relevant risk control products for purposes of classifying some as eroders?\textsuperscript{38}

We could make the same definitional point about contribution margins for products. Perhaps the assembly line jams and a group of widgets costs a bit more at the margin to produce, or a given run of widgets exhibits an imperfection and must be marked down. Just as a contribution margin for a product is calculated on average rather than unit by unit, the designations of \textit{contributor} or \textit{eroder} reference some relatively discrete risk category that is tractable for courts and parties to recognize. The question we are attempting to answer is similar to the one to which break-even analysis is directed in the product realm: is it a good idea to keep making this product?

Of course, in the case of actual products, the definitional question is driven by separability — the capacity to discontinue a discrete chunk of production and, with it, improve the firm’s overall profitability. That capacity is what makes the contribution margin analysis usefully relevant for decision-making in a production setting. In the tort context, separability can sometimes (but not always) be achieved by choosing a different precaution, like unloading the gun rather than stowing it. But separability of \textit{this} sort is not decisive for the somewhat different question that tort law seeks to answer: which risk control services was the defendant obligated to provide? Here, what is critical is not the \textit{actual} ability to separately provide the various risk control services, but rather the ability to identify costs that uniquely attach to the production of each service, and to assess how they compare with the benefits uniquely associated with that service.

Ultimately, product definition for risk control services should be driven by the demands of the tort system, including concerns about informational burdens and the effects of uncertainty and ambiguity on incentives. On these scores, we are likely to do best if we stick with broad product definitions (like anticrush and antishoot) that are easy for actors to tell apart ex ante and for fact-finders to tell apart ex post.

\textsuperscript{37} Such outlier cases could be, and sometimes are, treated as exceptions to negligence per se rules. See, e.g., Tedla v. Ellman, 19 N.E.2d 987 (N.Y. 1939) (recognizing excuse for violating a statute regarding which side of the road to walk along, where walking on the opposite side was safer).

\textsuperscript{38} This is a version of what is often termed the “reference-class problem.” See, e.g., Kenneth S. Abraham, \textit{Self-Proving Causation}, 99 Va. L. Rev. 1811, 1812 (2013) (observing that “the level of generality or specificity at which an issue is classified — the reference class that defines the issue — often predetermines resolution of the issue”).
2.3 Nonservices and Disservices

The question the analysis above tries to answer can be framed as whether a particular risk control service is really a nonservice (wash) or a disservice (eroder) that either does not help to justify or actually undercuts the case for taking a given precaution. The contribution margin analysis emphasizes that a risk control product can contribute to the social value of a given precaution even if it does not alone cover all of the costs of that precaution. The converse point, that some risk control products add nothing or actually detract from the precaution’s value, can be isolated by looking at whether the very thing that gives a particular risk control service value also concurrently produces equal or greater offsetting detriments.39

A few uncontroversial cases will help to illustrate this point.40 As we will see, all of them gain normative force from the fact that the countervailing detriments in question are (1) in a currency other than money, such as risk or discomfort, that seems at least roughly commensurate with the currency in which the risk service itself would be delivered; and (2) fall, in expectation, upon the same people putatively benefiting from the risk control service. While these criteria are not part of the standard efficiency analysis for assessing whether the defendant was negligent in omitting a risk control service, they help to further justify limits on the scope of liability.41

2.3.1 Coincidences

Consider the treatment of so-called coincidence cases, which represent a certain variety of wash. A classic example is Berry v. Sugar Notch Borough, where a speeding trolley car was randomly struck by a wind-blown falling tree.42 The


40 The case for nonliability may be overdetermined in some of these examples due to features that also cast doubt on whether the harm was foreseeable or brought about by an intervening act. But they nonetheless illustrate the core idea that risk control services can generate costs that are large enough to turn them into societal disservices.

41 See infra Part 5 on justifications for limiting the scope of liability. For an efficiency analysis that focuses on the role of externalized benefits generated by untaken precautions in justifying a harm-within-the-risk limit on liability, see Gilead & Green, *supra* note 2.

42 Berry v. Sugar Notch Borough, 43 A. 240 (Pa. 1899). The plaintiff was the driver of the trolley car and was injured by the falling tree. The question was whether his contributory negligence prevented him from recovering from the Borough for an allegedly negligent failure to maintain its tree. See id. at 240.
speeding was negligent, and it also caused the accident in a but-for sense. But it did so only by coincidence, by putting the car underneath the tree at the exact moment that it fell. Speeding could just as easily have prevented this accident by putting the car safely past the tree before it fell. Because reducing one place-and-time risk means increasing another of the same type, addressing place-and-time risks does nothing to help justify the costs of the no-speeding precaution. Thus, if the only negative upshot of a defendant’s failure to take the no-speeding precaution is that she failed to mitigate a particular place-and-time risk (such as being randomly smashed by a falling object), both intuition and doctrine give a clear answer: no liability.

Two factors make coincidence cases unusually easy to parse conceptually. First, the cost of the risk control service in question is paid in the same currency as its benefits, and in equal measure. To have produced a unit of antismash at 7:01:00 pm by not yet being present under the shaky tree, one would have had to forfeit an identical unit of antismash five or ten or thirty seconds later when one was indeed positioned under that tree.43 The second factor relates to the incidence of the precaution’s costs and benefits. Roughly the same people who benefit in expectation from the precaution also bear the expected costs of that precaution. When the two risks wash out, they do so not at a broad societal level but rather at the individual level, so that the precaution effects no distributive change. On a corrective justice analysis, no one has been wronged by the substitution of one time-and-place risk for another.

Coincidence cases may be dismissed as lacking a “causal link” with the harm, on the grounds they do not generally increase the risk of accidents of that type.44 Of course, the tortious act did (happen to) increase the risk of this particular instance of harm occurring when and where it did, but only by randomly reducing the risk of it happening in another place or time. Seeing coincidence cases as washes puts them on the same footing as other instances of risk reduction that are counterbalanced (or more than counterbalanced) by offsetting costs, whether those costs cash out in identical risks or otherwise.

43 See, e.g., Gilead & Green, supra note 2, at 1556 (noting the substitution of one risk for another).
44 See Guido Calabresi, Concerning Cause and the Law of Torts: An Essay for Harry Kalven, Jr., 43 U. Chi. L. Rev. 69, 71–72 (1975) (arguing that there is no “causal link” in the speeding-treefall scenario, assuming that the speeding did not increase the tree’s propensity to fall through vibrations, though there is “but for” causation); Porat, supra note 1, at 987–90.
2.3.2 Pollution

Pollution offers another intuitive example of a disservice that no one has any obligation to produce, even if it might have a protective character in some instances, and even if it is an inseparable by-product of something that one does have a duty to provide.

Suppose I am obligated (for some reason) to run a coal-fired lighthouse. One night I am derelict in my duties and fail to fire up the lighthouse. If a ship runs aground, I am liable; I had a duty to provide the service of illumination. But if the lack of coal soot reduces the customary grittiness of a nearby road surface and thereby causes an accident, I am not liable for that. This is true even though if I’d run the lighthouse, as I had an obligation to do, the accident would not have happened, and even though there is no way I could have met my lighthouse obligations (give technological constraints) without producing the “antislip” by-product of soot. Producing soot is a disservice to society, and I wrong no one by failing to provide it.

Antislip, in other words, is an eroder, not a contributor. Notably, the costs of the antislip service come in a currency (pollution) that seems roughly commensurate with the currency in which the benefits arrive (fewer accidents): both involve human health and well-being. The costs of the soot also fall on roughly the same people who benefit from its grittiness — the general public in proximity to my polluting lighthouse.

2.3.3 Drug Side Effects

Suppose that drug X is the best one to use for condition Y, and that failing to prescribe it when a patient exhibits condition Y is negligent. This drug has an unwanted side effect of sedation. A doctor fails to prescribe drug X to a patient with condition Y. This mistake does not harm the patient through the channel of her condition; somehow, luckily, she does not suffer as a result of not receiving the therapeutic effects of the drug. Unluckily, though, she hurts herself while doing calisthenics in her hospital room. She would not have been out of bed and doing calisthenics had she received the drug that she should have received, because its sedative effect would have knocked her out.

The “service” of sedation eliminates all the risks that come from being awake, but it also eliminates all the enjoyment that comes from being awake.

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45 It is of course possible that my polluting lighthouse is not a cost-effective precaution at all, given the externalities it generates. But I am assuming for the purposes of this example that it is cost-justified overall.
Although these costs and benefits are not in exactly the same currency, the tradeoff of accepting ordinary levels of waking-life risk so as to experience the enjoyment that consciousness makes possible is one that people overwhelmingly make. The costs of sedation fall directly on the patient, and, assuming that sedation was not part of her therapeutic plan, plainly swamp the benefits of sedation, making it a disservice to her on net. The patient was not wronged by not receiving this service, even though it did lead to her injury. Of course, she was wronged by not receiving the therapeutic services of drug X, but this wrong did not cause her any injury.

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The takeaway from these examples is that sometimes society would do as well or better without a given (alleged) risk reduction service, and that the failure to supply such a nonservice or disservice is not negligent. The same principle should drive the analysis in other contexts where multiple risk control services are produced jointly through a given precaution. This suggests Duncan is off the hook for Petra’s foot injury, just as the Restatement suggests, if anticrush is indeed an eroder, as I have posited. Neither the observation that the crushing risk is insufficient on its own to justify the precaution nor the converse observation that the omitted precaution increased the crushing risk to some degree can decide the question. We get the right answer by considering the cost structure of the precaution and the contribution margin of this particular risk control product.

3 Categories of Victims

The same contribution margin analysis can illuminate accidents that involve different categories of victims than the ones contemplated by the relevant statute or common law rule.

3.1 The Stairway Railing

Consider one of Porat’s examples, paraphrased: An employer is required by statute to add a certain kind of stairway railing if she employs more than five employees with disabilities.46 Although this employer does employ more than five employees

46 This example is adapted from one that appears in a Restatement comment. See Restatement (Third) of Torts: Liability for Physical and Emotional Harm § 14, cmt. g (Am. L. Inst. 2010). Like Porat, I set aside worker’s compensation laws and assume ordinary tort principles apply. See Porat, supra note 1, at 982 n.7.
with disabilities, she doesn’t add the railing. A person without a disability falls in a manner that would have been prevented by the required railing. Should the employer be liable for negligence per se?

Doctrine says no. Although this statute “is designed to protect against the type of accident the actor’s conduct causes” — i.e., falls — the victim is not “within the class of persons the statute is designed to protect,” and hence the actor is not deemed to be negligent toward the victim by virtue of having violated the statute.\(^47\) Porat argues that this is the wrong answer. The presence of people with disabilities may have been the critical factor that made the sum of benefits associated with the railing exceed its costs, but the benefits to people without disabilities represent an added (and possibly essential) reason to have it in place, and liability should therefore follow.\(^48\)

Importantly, the railing represents a “durable precaution.”\(^49\) Once it is installed it is ever-present, so it bundles together protections for people with and without disabilities, just like putting away the gun bundles together protection from shooting with protection for toes. In our gun discussion, we concluded that protecting people’s toes from the heaviness attribute of the gun was an eroder with a negative contribution margin, and that neutralizing this attribute would mean forgoing more in utility than is saved in risk. Here, we must consider whether the protection that the railing provides to people without disabilities augments or undercuts the case for the railing.

We might imagine several possibilities. The simplest supposition, and the one that Porat implicitly adopts, is that the railing’s only costs stem from its installation and maintenance. Because it is durable and will be there for everyone and for every circumstance, extending its protection to more people and more types of risks is costless, and the additional protection that is thereby generated only adds to the case for the railing. The railing works like a (local) public good, which is nonrival and nonexcludable — everyone present can benefit from it once it exists, even if some benefit more than others. If this assumption is correct, then everyone should indeed be able to sue for its absence, just as Porat suggests.

It is plausible that the minimum number of employees with disabilities specified in the statute is meant only to mark out a “break-even” point at which the up-front costs of acquiring and installing a railing are justified over some other kind of precaution that would protect those workers individually, but that everyone else enjoys positive spillovers from the railing’s existence. Points along these lines have been made with respect to many modifications initially mandated

\(^{47}\) **Restatement (Third) of Torts: Liability for Physical and Emotional Harm** § 14 (Am. L. Inst. 2010).

\(^{48}\) Porat, *supra* note 1, at 982–84.

\(^{49}\) See Grady, *supra* note 36, at 16–20 (discussing the durability and divisibility of precautions).
for people with disabilities, such as ramps and curb cuts, which are helpful to those wheeling suitcases or who have other minor or transient mobility issues that do not rise to the level of disabilities. On these assumptions “antifall for people without disabilities” has a positive contribution margin.

But it is also entirely possible that the railing has ongoing costs, apart from the lump sum expense of acquiring and installing it. Perhaps it occludes sight lines and provides a vector for the spread of viruses as people touch the railing, and these costs exceed the benefits it provides to people without disabilities. For the population of people without disabilities, it would be a bad thing on balance, and not a beneficial windfall, to have the railing in place even if it materialized at zero cost in time, money, or trouble. The rail-less stairway does present some dangers to people without disabilities, just like the gun’s heaviness did to Petra, but these dangers are (by hypothesis) exceeded by the benefits of rail-free navigation to people without disabilities. The ways in which the railing is bad for them eat into rather than buttress the cost justification for the railing’s construction. On these assumptions, “antifall for people without disabilities” would be an eroder.

If, in fact, the contribution margin for “antifall for people without disabilities” is negative, we would prefer that parties not make this product, if possible. Because the railing is manifestly durable, this observation may seem pointless. If the railing needs to be there for people with disabilities, as the statute mandates, then it is going to be there all the time whether we like it or not. Nonetheless, liability for failing to supply it to people without disabilities could impact decision-making in two ways. First, it might lead to excessive rail building where there is some degree of uncertainty about whether a particular workplace is covered by the statutory mandate, since the costs of guessing wrong will include liability to people without disabilities — people for whom, we are positing, the rail is a net negative. Second, it might dampen interest in innovative

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51 This distinction between fixed and variable costs makes an implicit appearance in Cooter and Porat’s analysis when they discuss protective clothing that might be separately supplied to different groups (employees versus visitors). Cooter & Porat, supra note 13, at 59. With protective gear, variable costs are incurred as the precaution is extended to each additional person, making it critical how the marginal benefits compare, as Cooter and Porat recognize. See id. The point here is that rolling out the railing to more audiences may, in fact, work similarly, if there are ongoing costs for these groups, and not just benefits.

52 Below, I work through a simple numeric example illustrating this possibility and others. See infra Part 3.2.

53 We might characterize this overbuilding tendency as a feature rather than a bug, however, given the distributive implications in this context. We may not want the two kinds of errors
precautions that deliver rail protection only to those to whom it is owed. Suppose, for example, that a “smart railing” could be developed that could read bar codes on ID badges or wristbands and pop up instantly when a person with a disability approaches and retract when no such person is present. An employer might not invest in this system if she will be held liable for falls suffered by people without disabilities.\textsuperscript{54}

To be sure, there are tricky problems of “product definition” implicated here. Maybe there are some employees who do not qualify as persons with disabilities but who would fit some other category like “extra clumsy” that, if considered separately, would benefit on net from the railing. Conversely, there may be subcategories of people with disabilities who, due to the nature of their disabilities, would suffer on net from the railing. One might even argue that the very fact a particular individual was injured as a result of the absent railing helps to establish their membership in a group that would have benefited on net from its presence. But allowing plaintiffs to define the reference class in this manner would enable endless efforts at creative category construction, ultimately collapsing into a post hoc justification for liability in every case. Where a statute or the common law carves the population into X and not-X, assessing the contribution margin based on these broad categories makes at least provisional sense.\textsuperscript{55}

There may be difficult empirical questions about whether controlling risk for the not-X population has a positive (but low) contribution margin, as opposed to being an eroder. Again, we can look to the law for clues. If a durable precaution like a rail works like a public good, such that each person who encounters it benefits from it on net, then why should not it be legally compelled whenever there are \textit{enough} people to make it worth the threshold cost, regardless of their status as having or not having a disability? If the contribution margin is positive as each person is added, then the precaution eventually becomes worth it for larger groups of people without disabilities.

\textsuperscript{54} A lower-tech alternative in some contexts might be to equip certain workers, and not others, with personal protective equipment. \textit{Cf.} Donovan v. Castle & Cooke Foods, 692F.2d 641 (9th Cir. 1982) (canning factory supplied workers with ear plugs and ear muffs to attenuate noise levels rather than implement an acoustical engineering solution).

\textsuperscript{55} This analysis assumes that the law proceeds categorically, although alternative approaches are conceivable. \textit{See generally} Omri Ben-Shahar & Ariel Porat, \textit{Personalized Law: Different Rules for Different People} (2021); Anthony J. Casey & Anthony Niblett, \textit{The Death of Rules and Standards}, 92 Ind. L.J. 1401 (2017). Here, we might imagine a fully personalized approach based on the railing’s value for each individual in each circumstance, if the informational difficulties could be surmounted. Perhaps a smart railing could detect when someone is fatigued, distracted, carrying something bulky, or suffering from a minor injury, and respond accordingly.
Of course, it becomes worth it sooner as the number of people with disabilities rises. So it makes sense that the employer should have liability for a smaller group that contains people with disabilities (that is, the break-even point is reached earlier). But if the contribution margin is really positive, the railing eventually pays for itself even if the population includes few or no people with disabilities, if sufficient numbers of such people interact with the stairwell over a long enough period of time (people-stairwell hours). If we do not observe liability in that context, it suggests something different: either a negative contribution margin, a wash, or a contribution margin that is so thin that it would require more people-stairwell hours than would likely occur in any real-world situation.

3.2 Aggregating and Dividing

Carving up populations for different liability treatment raises the concern that tort law will fail to account for the cumulative benefits of a given precaution. Suppose that the stairway railing rule was actually justified in part by the benefits to people without disabilities.\(^56\) If so, an injurer who is held liable only for the lack of a railing when it injures people with disabilities might not put in the railing at all, because these injuries, on their own, equate to less than the cost of the railing precaution.\(^57\) This point is well taken. However, its force depends on the implicit assumption that the contribution margin is positive for the risk control product that the rail would supply to people without disabilities. If we alter that assumption, the concern disappears and the normative prescription flips.

To start, consider how the argument works when the contribution margin is positive for the entire population, but one group benefits more than the other. Suppose we have 100 people who are at risk of falling if there is no rail. A railing costs $800, no matter how many people it protects.\(^58\) Suppose half of our population (Group A) gets benefits of $13 each, given their higher risk of falling, and the other half (Group B) only gets benefits of $5 each. Is the $800 precaution worth taking? Yes, but only if we consider both groups together: Group A benefits $650 ($13 \times 50) and Group B benefits $250 ($5 \times 50), for a total of $900.\(^59\) If we distinguish two risk control products, antifall for Group A and antifall for Group B, both have positive contribution margins because each has benefits that outweigh the (here, nonexistent) marginal costs of the railing, albeit by different amounts. Even

56 See Cooter & Porat, supra note 13, at 49–50.
57 See id. at 51–52.
58 I assume here the rail is indivisible, an all-or-nothing proposition.
59 For a similar numeric example using aggregate figures for each group, see Porat, supra note 1, at 982–83.
though Group A benefits more than Group B, both groups are integral to the cost justification of the precaution, and holding the defendant liable for injuries to both groups is essential to incentivizing its provision.\footnote{60}{See \textit{id.} Even if both groups were \textit{not} integral (say Group A’s benefits were sufficient on their own to cover the cost of the railing), there is still no reason to truncate liability if the nonrival railing acts as a public good that costlessly protects more people and delivers net benefits to the people without disabilities. See \textit{id.} at 983–84 (discussing advantages of applying the same rule regardless of whether liability for background risk to people without disabilities is necessary to incentivize the railing precaution).}

Next, notice what happens if we imagine there are ongoing costs associated with the railing that are not part of the fixed lump of costs involved in constructing a railing. Suppose the fixed costs of the rail are still $800, but there are also variable costs of $6 per person in the form of disease vector risks and occluded sight lines. Members of Group A get marginal benefits of $25 per person, while members of Group B get just $5 per person. Let’s look at the contribution margin for our two varieties of antifall. Antifall for Group A yields a per-unit margin of $19 ($25 − $6). As this product is rolled out to the 50 Group A members, the fixed costs of the railing ($800) are more than covered ($19 × 50 = $950). Antifall for Group B yields a per-person margin of negative $1, so that rolling out the rail benefit to this group eats into the fixed cost coverage to the tune of $50 ($1 × 50). The rail is still cost justified overall (the total net benefits to A and B sum to $900, which is still more than the $800 fixed cost), but antifall for Group B is an eroder.\footnote{61}{On these numbers, the railing would quickly start to become a losing proposition overall if Group B were significantly larger than Group A. Just as I suggested above some room for doubt that antifall is a contributor for the nondisabled population, given that there is no numeric trigger at which the railing is required for people without disabilities, one might counter the claim that antifall is an eroder for the nondisabled group by observing that the law speaks only to absolute numbers of people with disabilities rather than the ratio between people with and without disabilities. If there were really a negative contribution margin for one group and a positive contribution margin for the other, the ratio between the two groups, rather than just the absolute numbers in one group, would be highly relevant to the precaution’s efficiency. However, distributive considerations that favor the protection of vulnerable populations might push against allowing the ratio to make any difference. Indeed, the conclusion that the railing serves Group A and disserves Group B depends on a baseline in which Group A faces greater exposure to falling risks than does Group B. The rail plausibly produces an equal end-state level of navigational safety, enjoyment, annoyance, and risk for both groups, which might be a more relevant fact under some conceptions of fairness than the magnitude and direction of the change that it effects from the preexisting baseline for the two groups.}

Here, liability for injuries to a member of Group B would mean holding the defendant liable for not providing a net bad in expectation to individuals in that group — even if this particular plaintiff came out worse without the rail. The
service that the defendant failed to provide to the plaintiff would have been a
disservice.62

4 Other Examples

A few additional familiar examples will help to further flesh out how the con-
tribution margin analysis works on the ground to address harm-within-the-risk and
negligence per se issues.

4.1 Parking by the Fire Hydrant

A common example in the literature involves a car illegally parked next to a fire
hydrant that is slammed into by another vehicle that is swerving to avoid a haz-
ard.63 Is the parker negligent per se in this story? The standard assumption is no,
because the prohibition on parking by a fire hydrant is designed to address the
risks associated with blocking the hydrant, not the ordinary risks that occur
whenever one parks anywhere alongside the curb. Moreover, it is often noted that a
parker who followed the law about not parking in front of the hydrant would have
parked somewhere else instead, where the risk of being hit by the random car
would have been just as great. Cooter and Porat argue for a no-liability result on
causation grounds, finding “no causal link between the unlawful parking and the
resulting injury.”64 Similarly, Kenneth Abraham concludes that the harm was not
within the risk, adding that “[t]his answer can be given so confidently because the

62 Put another way, Group B members benefit when the employer violates its duty to Group A. In
time, members of Group B should have to disgorge these gains when a member of Group A is
injured, while the employer’s liability to the Group A member should be adjusted downward in
light of these offsetting benefits to Group B. See Ariel Porat & Eric Posner, Offsetting Benefits, 100
VA. L. REV. 1165, 1189–91 (2014). In fact, these adjustments are unlikely to occur, leaving the
employer with expected liability that exceeds net social harm. See id. at 1190. Liability to Group B
members who actually benefited in expectation from the employer’s breach would widen the gap
between the net social costs of the breach and the employer’s exposure for it.

63 See, e.g., Cooter & Porat, supra note 13, at 55–56 (discussing Rauh v. Jensen, 507 P.2d 520 (Mont.
1973), in which a motorcyclist swerved to avoid a collision and hit a car illegally parked by a fire
hydrant and too near an intersection); Kenneth S. Abraham, The Forms and Functions of Tort Law 143–44

64 Cooter & Porat, supra note 13, at 56. They use the idea of a “causal link” in the sense discussed
by Guido Calabresi, to denote not the lack of but-for causation in the particular instance but the
lack of any increased occurrences over time if the behavior were repeated. See Calabresi, supra
note 44, at 71–72.
act of parking by the hydrant instead of a dozen feet further down the street simply
does not increase the risk of the harm that materialized."65

This analysis is unsatisfying. The reason is obvious if we consider why any
normal person would ever even consider parking in front of a fire hydrant. Most
people do not park illegally by fire hydrants because they are intent on thwarting
firefighters, but rather because there is literally nowhere else to park.66 The car by
the hydrant is typically an extra car at the curb in a given block, generating a small
but real increase in the risk of a collision. If the parker followed the law, the car-by-
the-curb risk alleviated near the hydrant would likely not have been reproduced
elsewhere nearby in an equal and offsetting amount. Rather, the law-abiding
parker would not be a parker at all in that scenario, at least not curbside in the
overfilled block in question. By not parking, she would have delivered an extra risk
reduction product, anticrash, in addition to the firefighting benefit (call it anti-
flame) that receives top billing. But is anticrash worth producing?

The analysis here is similar to that for the gun. There are certain costs involved
in moving one’s car away from the hydrant space. But the real costs are incurred
moment by moment as the space is left vacant, and cash out in inconvenience. The
nonblocking of the hydrant produces benefits (in the form of a standing option for
firefighters to use the hydrant) that outrun those costs in real time as anti-flame is
generated. Subtracting a car from any stretch of pavement, whether or not a hy-
drant is nearby, also generates units of anticrash by preserving a “swerve zone” for
other drivers. But does the cost of forgone parking outpace those benefits?

Here we can observe that any extra car anywhere along the curbside creates an
additive risk of a crash (by diminishing the swerve zone), yet is not forbidden. This
implies that the per unit costs of producing anticrash by removing a car from the
scene exceed the benefits thereby produced. Nor would we think that there is any
significant nonlinearity in providing anticrash in this manner. We might expect
that each marginal car-length of vacant curb produces roughly the same increment
of anticrash, whether it is one of many such vacant stretches on a given block, or
the last one on an otherwise completely filled block.

If so, then the fact that not parking by a hydrant will, under crowded street
conditions, subtract one car from the curb and produce a unit of anticrash, is a
regrettable side effect that reduces the social benefits of the parking restriction
rather than augmenting them. If there were a precaution that could keep the

65 ABRAHAM, supra note 63, at 144.
66 Obviously, there are exceptions — people who are antisocial, enjoy breaking rules, are too lazy
to walk an extra few feet, and so on. The point of my observation is not to defend the moral
character of hydrant parkers, but rather to suggest that hydrant parking is typically additive in
nature rather than purely substitutive.
hydrant unblocked but still allow use of the area for parking — such as an “auto-
relocate” function that would move the car elsewhere whenever a fire engine
approached the hydrant — it would be better. Like the ever-present rail in the
earlier example, the constantly mandated space buffer bundles together one risk
control service that is worthwhile (antiflame) and another that does not earn its
keep (anticrash). Even though the latter does provide a real service, it is a service
that is too costly to provide.67

Note, however, that the currency in which the costs are likely to be paid
(wasted time and inconvenience) varies from the currency in which the benefits are
obtained (marginally fewer crashes). The incidence of those costs may vary as well.
Although drivers might in expectation both gain from easier parking and suffer
from reduced swerving options, third parties might also be impacted. Perhaps a
 crash between a driver and a parked car will occasionally hurt pedestrians, who
gain nothing from the extra parking area. Other externalities associated with
driving and parking might suggest that drivers need more, not fewer, incentives to
avoid a crowded block that has no remaining legal spaces.68 Even though anti-
crash is still likely an eroder that the parker should not be held liable for failing to
provide, the case is a closer one normatively than existing treatments
acknowledge.

4.2 Sheep on a Ship

Another famous negligence per se scenario involves sheep on a ship.69 In Gorris v.
Scott, a shipper failed to put sheep in pens during their journey, as was required by
statute to address the risk of contagious diseases, and the unpenned sheep were
washed overboard. Here we can ask whether the sheep shipper was obligated to
provide not only disease mitigation but also washing-overboard mitigation. We
cannot arrive at an answer merely by observing that washing-overboard services
on their own would not be sufficient to justify the penning requirement. Perhaps it
is a “background risk” of non-penning that helps to support the case for the pen
once we add the disease risk.70 Or perhaps it is simply a fortuitous result of the pen
being present, an added bonus associated with the pen that helps to increase the

67 The exact price may be unclear. Will our would-be parker orbit the block endlessly? Will she
pay to park in a garage? Will she instead foresee the difficulty parking and stay home or take a bus?
68 We might also worry that liability only for blocking firefighters would underdeter, as this
involves a low-probability high-stakes event that parkers might tend to under-forecast. See infra
Part 5.2.1 (noting this concern and some potential means of addressing it, including regulation).
69 See Gorris v. Scott [1874] LR 9 Exch. 125 (Eng.).
70 See COOTER & PORAT, supra note 13, at 50–54 (discussing background and foreground risks).
social value it provides. In other words, perhaps there is a positive contribution margin associated with supplying “antiwash” as well as “antidisease.”

If this were so, then the analysis above would suggest that liability would be appropriate (contra the result in the case) when the sheep were washed overboard due to the shipper’s lack of compliance with the penning requirement. We can assume, however, that other sorts of cargo, presumably also at risk of washing overboard, did not have to be penned in. Just as in the paperweight case, we might wonder whether penning requirements would eventually be justified for either very valuable cargo or for very lengthy voyages. Even if the contribution margin is small, if it is positive, we might still expect to reach the break-even point eventually. If we do not ever see penning requirements imposed even when journeys are long and cargo is valuable and prone to being washed overboard, it casts doubt on the positive contribution margin theory, although it does not definitively rebut it.

We can get at the problem from another angle by asking whether there are any variable costs uniquely associated with the service of antiwash, which counters the mobility of the sheep, as distinct from the cost of the pen itself and its capacity to counter disease communication among the sheep. If there were no sheep diseases, and the pen was already built and paid for, would it be a net positive or negative from a cost-benefit perspective to use it to supply the antiwash services? Would it be worthwhile to neutralize the risks that come from sheep moving around on the deck, if the only costs involved were the moment-by-moment restriction of free ovine movement?

The answer might seem obvious — what’s not to like about a pen that solves an evident problem? But we would need more facts to be sure. Is it harder day by day to care for the sheep if they cannot move around freely? Do they experience more stress from being penned in place versus moving about in the fresh ocean air — a fact that might influence health or survival rates? On examination, antiwash might be a societal disservice, a regrettable side effect of the pen’s existence, rather than an added boon.71 It might have a negative contribution margin. Moreover, it seems that the currency and incidence of the costs and benefits align, if the primary entries on both sides of the ledger are the health and

71 We can reach this conclusion on contribution margin grounds even if we assume that there is no way to supply antidisease without also supplying antiwash (and vice versa). In fact, the two risk control products may be disaggregable under some imaginable scenarios. See Keeton, supra note 4, at 15–16 (arguing that the wrongful aspect of the shipper’s action can be separated from the non-wrongful aspect, and observing that it is possible to imagine a pen configuration that would have protected against washing overboard without protecting against disease). Conversely, the sheep might have been separated from contact with each other by some means that still left some or all of them vulnerable to being washed overboard.
well-being of the sheep, which the owner of the sheep would (at least in theory) internalize.72

4.3 Delivery Options

Cooter and Porat discuss a particularly difficult example, based on an Israeli case, involving a doctor's choice between delivering a baby vaginally and performing a C-section.73 In their example, the doctor chooses to deliver vaginally, even though the baby's large size made this choice negligent. The baby died, but for a reason unrelated to size: a knot in the umbilical cord. There was no reason prior to delivery to suspect any elevated risk of such a knot, but the general risk of a fatality from a knot was greater for a vaginal delivery than for a C-section. However, the knot risk on its own would not have justified the C-section, given the other risks of that procedure.74

The likely doctrinal result would be no liability, because the risk that eventuated (the knot) was not the sort of risk that made the actor's conduct negligent. Consistent with their analysis of other problems, Cooter and Porat argue that this outcome is wrong, and that the fact that the negligent conduct increased the background risk (knot) as well as the foreground risk (relating to large size) should lead to liability.75 Notably, their analysis assumes that there is a single fixed cost associated with performing a C-section.76 As in the stairway railing context, they assume that the omitted precaution would have operated like a local public good for all of the risks that it impacted. Under those assumptions, which implicitly attribute a positive contribution margin to "antiknot" as a risk control service, their analysis is correct.

The question we must examine, however, is whether there are any costs uniquely associated with providing antiknot that must be considered along with the benefits. Here we would need to know more about the cost structure for the C-section. Is there just one unified lump of expense and risk that is incurred all at once whenever the surgery is undertaken, regardless of the particular risk control services provided? If so, then antiknot has a positive contribution margin, even if it is not enough on its own to justify the C-section. Here, addressing the knotting risk

72 In fact, the sheep owner might be more concerned about sheep fatalities than sheep happiness, if the latter was not fully reflected in the market value of the sheep.
73 See Cooter & Porat, supra note 13, at 53.
74 See id.; see also Johnson, supra note 18, at 950 (discussing this example and noting its sensitivity to the level of generality at which background risk is defined).
75 See Cooter & Porat, supra note 13, at 53–54.
76 Id. at 54.
involves no additional costs and introduces no new drawbacks. But if there are knot-specific costs in the picture, similar to the flow of inconvenience from not having heavy objects on the desk, these might outpace the benefits of the antiknot services.

We can get at this question by considering whether a baby who is not of large size would benefit on net from a C-section if all the fixed costs of the surgery were covered. We know that she would receive the incidental benefits of antiknot services. But would the very thing necessary to mitigate knotting risk (say it is greater exposure to the delivery room environment) impose even greater costs on her in some other way, as the surgery proceeds? In other words, are there disadvantages uniquely attributable to producing antiknot that give it a negative contribution margin, so that it erodes rather than augments the case for the C-section? If so, antiknot is a disservice, not a service, and it is not something that the doctor is obligated to provide.

Unlike the stairway railing situation, however, where we might say that the very plaintiff before us was benefited in expectation rather than harmed by the absence of the railing (under the supposition that it had a negative contribution margin as to people without disabilities), we cannot say that of the baby in this example. On the assumptions above, the baby was disserved in expectation by not receiving bigness mitigation, but benefited in expectation by the doctor failing to produce the (on net risky) antiknot service — even though the latter service would have been beneficial in this particular case. The baby was harmed by a bad decision about her treatment, but the route through which harm eventuated was not the basis of the bad decision.

We might test our intuitions about this situation by imagining that a mother is delivering twins, one of whom is oversized and one of whom is not. Assume that a C-section delivery must be provided to both twins or neither, and that the expected benefits to the oversized twin are large enough to justify this delivery method for both. Suppose the C-section is omitted and the smaller twin dies due to a knot that would not have been fatal if a C-section had been performed. Yet the smaller twin’s overall risk of dying during delivery was reduced in expectation by the doctor’s negligence, even though the specific risk that eventuated was increased.

Now we are back to a stairway railing scenario where we attempt to evaluate if the smaller twin would have gotten a windfall in background risk reduction once the C-section was undertaken for the larger twin, or whether it still would have been better (in expectation) for this smaller twin not to have gotten the C-section. If the C-section was a disservice in expectation for this twin, even once the fixed costs were covered, then liability should not flow from its omission. The same result seems correct even when there is just one baby who was (harmlessly) disserved in the domain of bigness and (fatally, but in expectation, appropriately) treated in the domain of knotting.
Of course, it is quite plausible that, as Cooter & Porat assume, antiknot does have a positive contribution margin. This example (and some of the others) might make us wonder whether it might be better to always impose liability for such risks, rather than attempt to determine whether the contribution margin is positive or negative. What, if anything, do we gain from limiting the scope of liability? The next Part considers this question.

5 Why Limit Liability?

Suppose you agree at the level of theory that there could be risk control services generated by an efficient precaution that are eroders, and not worth providing. How do we get from that observation to a no-liability judgment for defendants who, by all accounts, negligently failed to take a precaution that would have prevented a given accident? Shouldn’t we just hold them liable anyway, rather than leave the loss on the victim? What is the downside of giving defendants another good reason to do the thing that they absolutely should have done anyway (albeit for different reasons)?

The sections below take up this question. I start with an argument that sounds in the corrective justice register: that a defendant who failed to deliver a risk control disservice did not wrong the plaintiff. I then consider two instrumental objections to the contribution margin approach. Finally, I turn to two incentive-based arguments for limiting liability to instances where an omitted risk control product was a contributor rather than an eroder or a wash.

5.1 The Missing Wrong

Where tort liability is conceptualized as addressing wrongs, a no-liability result follows axiomatically from the fact that an injurer has not wronged the plaintiff. Learned Hand put it this way:

[S]o long as it is an element of imposed liability that the wrongdoer shall in some degree disregard the sufferer’s interests, it can only be an anomaly, and indeed vindictive, to make him responsible to those whose interests he has not disregarded.

77 Keeton, supra note 4, at 21–22 (posing this question and answering it in the negative).
78 Sinram v. Pennsylvania R.R. Co., 61 F.2d 767, 770 (2d Cir. 1932); see also Keeton, supra note 4, at 22–23 (quoting this language from Judge Hand’s opinion in Sinram and describing it as a powerful expression of the policy rationale for limiting liability on harm-within-the-risk grounds).

Electronic copy available at: https://ssrn.com/abstract=4242348
This understanding of wrongs is relational in nature: the risk that eventuated in harm must have been an unreasonable one for the defendant to have imposed on this plaintiff.\textsuperscript{79} In the standard harm-within-the-risk scenario, the defendant did something wrong by failing to take a cost-justified precaution, and the plaintiff was harmed as a result of this shortfall. But did the defendant wrong the plaintiff? That depends on the type of risk and the type of victim involved in the accident.

The approach developed in this essay implies that we can assess the wrongness of the defendant’s actions towards the plaintiff by asking whether her injury flowed from the defendant’s failure to provide a risk control service that he was obligated to provide to her. That question of obligation can, in turn, be answered by considering whether the omitted risk control product contributed to or cut against the case for the untaken precaution that would have supplied it. Would controlling the risk in question, or controlling it for the class of potential victims to which the plaintiff belongs, be a losing proposition even if the fixed or common costs of the precaution were covered? If so, then failing to provide it is not a wrong, even if its nonprovision comes bundled with wrongful shortcomings (like failing to control the shooting risk in Duncan’s case) that did not eventuate in harm to this particular plaintiff on this particular occasion.

This categorical claim — that an injurer has not wronged the plaintiff by failing to provide a risk control service that amounts to an eroder or a wash — follows from a normative view that actors are not obligated to spend more on accident prevention than is thereby gained in reduced accident costs.\textsuperscript{80} On this account, it is not unreasonable, and hence not wrongful, to fail to control a risk that could not be addressed cost-effectively. Clearly, not everyone adopts this view as a blanket matter, without regard to the kinds of costs or risks involved. Here, the factors of currency and incidence introduced above may come into play.\textsuperscript{81} While many would resist the idea that an actor’s own monetary costs or minor inconveniences should be weighed on the same scale as risks of physical harm to others, everyone seems to agree that an actor is not required to reduce one risk to others through means that will create an equal or larger risk to the same individuals.\textsuperscript{82}

On a relational analysis, there is an especially compelling case for nonliability where the defendant would have been providing a disservice to this plaintiff, in

\textsuperscript{79} In other words, to use an expression favored by Benjamin Cardozo, “negligence in the air, so to speak, will not do.” E.g., Palsgraf v. Long Island R.R. Co., 162 N.E. 99, 99 (N.Y. 1928) (Cardozo, C.J.) (quoting FREDERICK POLLOCK, THE LAW OF TORTS 455 (11th ed. 1920)); see also Hurd & Moore, supra note 6, at 334 (discussing the relational view of negligence).

\textsuperscript{80} This is the understanding of negligence suggested by the Hand formula. See supra note 23.

\textsuperscript{81} See supra note 41 and accompanying text.

\textsuperscript{82} Hence the universal agreement with the no-liability outcome in Berry v. Sugar Notch Borough, 43 A. 240, 240 (Pa. 1899). See supra note 42 and accompanying text.
expectation, had he controlled the risk that eventuated in the plaintiff’s harm. For instance, under one set of assumptions, the stairway railing would be a net disservice (in expectation) to people without disabilities. Liability in that case seems inappropriate, given that it flows from the injurer’s omission of an act that, considered ex ante, held more expected harms than benefits for the victim. Even though the defendant did do something wrong (towards someone else, or with respect to a risk other than the one that eventuated), the plaintiff was made at least as well off in expectation, as to the risk that eventuated, by the defendant’s shortfall.83

Tort doctrine does not generally require such a strong and specific showing — that the defendant’s omission would have disserved the plaintiff in expectation — to establish that the failure to control a given risk was not unreasonable, and hence not wrongful. Cases outside the bounds of the harm-within-the-risk doctrine instead suggest the relevance of an overarching inquiry: whether the risk that eventuated in harm was one that the defendant could cost-effectively control. The reasons for a negative answer may range from the risk’s unforeseeability, to another actor’s decisive influence over it, to the fact that controlling it for one group introduces greater risks for another.84 A risk’s status as an eroder or wash in this essay’s schema likewise suggests that it is not the sort of risk that is amenable to cost-effective control as a general matter (paperweights are not generally negligent) even if a precaution that addresses other obligations of the defendant would incidentally reach some incarnations of it (the gun as a paperweight). Focusing on the relational nature of wrongs can thus harmonize the approach here with other liability limiting doctrines.

83 That the plaintiff may have been made worse off in expectation as to other risks that did not come about should not matter under a normative approach that treats actual harm — stemming from a wrongfully imposed risk — as an essential ingredient of a wrong. While we could imagine a system of liability based on risk exposure alone, that is not how our tort system works. See, e.g., Porat & Stein, supra note 7, at 103–10.

84 For instance, a defendant may justifiably choose a less effective precaution as to one set of potential victims in order to avoid creating larger risks for another set of potential victims. The former group is not wronged, though they are disadvantaged, because reducing their disadvantage would come at an unreasonably high price, which here cashes out in the currency of risk to others. See, e.g., Lucchese v. San Francisco-Sacramento R.R. Co., 289 P. 188, 189 (Cal. App. 1930) (train engineer’s decision not to apply airbrakes in response to a truck on the tracks, but rather to slow the train by a less abrupt method, was not negligent; while the former would have been more effective at avoiding colliding with the plaintiff’s vehicle, it would have likely injured many train passengers by throwing them to the floor). I thank Mark Grady for this example.
5.2 Instrumental Objections

On an instrumental analysis, the fact the injurer did not wrong the victim need not rule out liability if there is some other reason why holding the injurer responsible will help to align incentives, minimize accident costs, or otherwise promote welfare. Below, I consider two objections to letting negligent defendants off the hook on the grounds that the risk that eventuated was not one they were obligated to control.

5.2.1 Underdeterrence

Suppose a given precaution jointly produces two risk control services, one that is worth providing (a contributor) and one that is not (an eroder). Won’t absolving the defendant of liability for omitting eroder services make it less likely that the precaution will be taken, and hence less likely that the worthwhile risk control service will be provided? In a word, yes. But the same point could be made about any liability limiting doctrine or principle, including the requirement of but-for causation. Making a defendant who omitted an efficient precaution liable for a larger range of outcomes — including ones wholly unrelated to the negligent behavior itself — would undoubtedly add to the incentive to provide that precaution.85 Yet tort law generally attempts to restrict liability to risks that a defendant could cost-effectively control. To what extent should concerns about underdeterrence lead it to do otherwise in this context?

If we understand negligence law not as an avenue for redressing past wrongs, but rather as an opportunity to deter negligent behavior going forward, then the guiding principle is one of optimal deterrence.86 On this account, specific doctrines are just means to an end, and can be shaped accordingly. But adjusting the scope of tort liability is not the only way for law to impact incentives or ratchet up deterrence. In addition to the possibility of altering the magnitude of damages when a within-scope accident occurs, law can (and often does) address behavior through regulation, which imposes fines and other penalties independent of any specific harmful outcomes that flow from violations.87 Thus, the hydrant parker may get a ticket, whether or not firefighting is impeded. Regulation can increase

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85 So too would imposing much larger damages on the defendant than the amount of harm that was actually done, as through punitive damage awards.
86 Keating, supra note 5, at 307. Notably, underdeterrence is not the only potential concern in the story; overdeterrence can also be costly. See infra Part 5.3.1.
compliance with a legal rule by ramping up the probability of consequences rather than leaving them to the happenstance of accidents — low-probability events that people have a tendency to discount.88 Expanding the set of eligible accidents would be a comparatively haphazard way to attempt to increase deterrence.89

To test intuitions on this point, consider again Berry v. Sugar Notch Borough, where the speeding trolley was struck by a tree.90 Why not use the accident as an occasion to reinforce the rule against speeding by imposing liability on the speeder? Similarly, why recognize any limits based on foreseeability or the intervening acts of other parties, rather than take every available opportunity to slam a defendant with liability for having omitted an efficient precaution? The fact that liability is tied, in our tort system, to compensation to the victim should give us pause in instances where the victim can influence the outcome, as should the possibility of overdeterrence.91 There is a floodgates concern as well, if recourse to tort liability is opened up to anyone who is harmed anywhere in the penumbra of a person who failed to take an efficient precaution. And even those who take a purely instrumental view of tort liability might find distasteful the scattershot manner in which such additional liability would augment deterrence.

That said, there are contexts in which tweaking tort liability is an appropriate way to address underdeterrence concerns: where it would remove a distortion that a straightforward application of doctrine would produce. Indeed, there is a related set of arguments that crops up in the context of choosing the appropriate standard of care. Often, mitigating a particular type of risk (like being hit by wayward cricket balls) involves an incremental, cumulative technology (like building a fence) that begins to be unworthwhile at a certain point (when the costs of the next segment of fence-height outstrip its marginal benefits in blocking high-altitude balls).92 Yet the fence’s total benefits may continue to exceed total costs as increments are added beyond the efficient point, even though those later increments erode rather

89 It might seem that this argument proves too much. If regulation works so well, then why not use it exclusively, and ditch tort law altogether? One answer relates to information: it is not always clear how best to reduce risk, and tort liability can induce actors to use their specialized knowledge, and invest in acquiring more, in order to find the kinds of measures that can most efficiently reduce accident costs. See Shavell, supra note 34, at 277–90.
90 Berry v. Sugar Notch Borough, 43 A. 240 (Pa. 1899).
91 See infra Part 5.3.1.
92 This example, a staple of the torts literature, is based on Bolton v. Stone, [1951] AC (HL) 850 (appeal taken from Eng.).
than contribute to the surplus of benefits over costs. So a plaintiff might be able to show that a cost-justified fence (in the sense of total benefits exceeding total costs) would have prevented her accident even though a fence of optimal height would not have.93

A defendant who built no fence may face liability under these circumstances, given that he failed to take a precaution that is both cost-justified and causally related to the accident.94 This sounds like a mistake, given the apparent lack of a causal connection between negligence and the accident in this scenario.95 But as Mark Grady has shown, it may not be, given the effects of liability on the defendant’s incentives to construct the optimal fence.96 The structure of negligence law can at times produce incentives that are skewed in the direction of too little care, and liability for untaken precautions that reach beyond the efficient point may serve as a corrective to this tendency.97 Hence, it could be efficient to hold a cricket club that built no fence at all liable for an accident that would have been prevented only by a fence that was somewhat higher than optimal. Under some assumptions, such liability makes the mistakes of overshooting and under-shooting the fence’s ideal height equally costly to a defendant.98

Significantly, that analysis concerns cases where units of additional care buy more of the same kind of risk reduction services. In other words, it applies to questions about the standard of care (how many increments of precaution to take) rather than the scope of liability (which risks one has a duty to neutralize).99 Can

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94 See Mark F. Grady, A New Positive Economic Theory of Negligence, 92 YALE L.J. 799, 821–29 (1983). Note, however, that a defendant who built an optimal fence would not face liability, because the plaintiff could not then demonstrate that any additional precaution would have been cost-justified. See id. at 814–16.
95 See Marcel Kahan, Causation and Incentives to Take Care Under the Negligence Rule, 18 J. LEGAL STUD. 427, 428–29 (1989).
96 Grady, supra note 94, at 814–21 (explaining how allowing plaintiffs to prevail when they can demonstrate that a cost-effective untaken precaution would have prevented their injuries can improve injurer incentives in the presence of uncertainty); see also Fennell, supra note 21, at 2397–2421 (discussing Grady’s approach).
97 This is because a potential injurer who exceeds the optimal level of care bears the added prevention costs for doing so, but gets none of the incremental benefits associated with reducing more accidents (since liability is already at zero once due care is reached), whereas a potential injurer who falls below the optimal level of care bears the associated liability but also saves on prevention costs. Charging that below-standard potential injurer for somewhat more than the marginal liability associated with the degree to which she is below due care can correct this skew. See Grady, supra note 94, at 814–21; Fennell, supra note 21, at 2401–13.
98 Grady, supra note 94, at 818–21; Fennell, supra note 21, at 2407–09.
99 See COOTER & PORAT, supra note 13, at 51 (“The problem with negligence per se… concerns the scope of liability, not the standard of care.”).
we make an analogous argument for extending the scope of liability to reach eroders and washes? Such an argument would run like this: Duncan should have done something to control the shooting risk. He did nothing. Some of the things he might have done would have also controlled other risks. Indeed, we can readily imagine a precaution that would have simultaneously addressed both the shooting risk and the toe breakage risk that materialized for Petra — stowing the gun. Should Duncan be held liable for all the risks that flow from any precaution that would have controlled the shooting risk, so long as its total benefits outweigh its total costs, to increase his incentive to (somehow) control the shooting risk?

The best answer is no. Unlike in the fence height case where each additional increment of care cumulatively prevents more accidents of the same type without introducing any new ones, different precaution bundles may be all over the map in terms of which accidents they prevent and permit. Precautions that neutralize eroder risks often exact in-kind payments from potential victims or third parties, which means that the defendant does not realize the benefits of omitting them. Allowing plaintiffs to manufacture liability by identifying precautionary bundles that graft eroder risk control products onto high-margin risk control products is an unnecessarily cumbersome and costly way to ramp up incentives for socially valuable risk control services.

There may well be uncertainty about whether a given risk control service actually is (or will be found to be) a contributor or an eroder. But it seems unlikely that this uncertainty would produce a systematic skew in the direction of underdeterrence, absent some reason to suspect a shortage of plaintiffs to ensure provision of the risk control products that are undeniably contributors. Moreover, the lumpiness of precautions already makes it hard for actors to avoid controlling an inefficiently large universe of risks. Instead of correcting a skew, then, liability for not addressing eroder risks likely exacerbates an existing skew.

100 Cf. Stephen Marks, Discontinuities, Causation, and Grady’s Uncertainty Theorem, 23 J. LEGAL STUD. 287, 296–97 (1994). Although Marks makes this point in critiquing Grady’s approach to increments of care, it applies more clearly in the context of precautions aimed at different bundles of risks.

101 See generally Gilead & Green, supra note 2 (presenting a positive-externalities critique of arguments against limiting the scope of liability); supra Part 2.3 (discussing the incidence of the costs attributable to particular risk services). This again distinguishes the fence case, where the defendant gleans all the cost savings of a shorter fence.


103 See supra note 36 and accompanying text.
5.2.2 Administrative Costs

Another objection to the contribution margin approach developed here is that it would be too difficult for courts to administer. It is worth emphasizing at the outset that the use of negligence per se rules (or equivalent common law doctrines) already represents a choice to sacrifice some degree of precision for clarity, by employing a categorical rule rather than an open-ended standard. Given that, what are the administrative cost implications of choosing my approach to harm-within-the-risk over an alternative? There are two obvious comparators: (1) the current doctrinal approach, in which harms deemed “outside the risk” are not bases for imposing tort liability; and (2) an approach like that of Cooter and Porat, which would impose liability whenever the violation of the rule increased the risk of an accident of the type that occurred (unless some other liability limiting doctrine came into play).

The contribution margin falls in between these two approaches, recognizing liability when a harm flows from a contributor risk (even if it is not the main risk behind the rule and would not justify the precaution on its own) but not when it flows from an eroder or wash risk (even if the chance of that type of harm was increased by the defendant’s behavior). As such, it has the potential to add some degree of precision in matching liability to unreasonable risk. But at what cost? Sorting risks into the schema’s categories (contributors, eroders, and washes) may indeed prove challenging in practice. Yet the downside of getting it wrong is bounded on the one hand by the standard doctrinal approach, under which all secondary or background risks are ignored (even if they are actually contributors) and the Cooter and Porat approach on the other, under which all secondary and background risks count (even if they are actually eroders or washes). And it may often be possible to get it right.


105 Of course, added precision could be introduced by other means. The liability shortfalls produced by the standard doctrinal approach could be filled in with regulatory penalties or heightened damages, while the ways in which the Cooter and Porat approach might overshoot liability could be addressed by adjusting damages downward to account for the social costs of controlling eroder and wash risks. These adjustments are not costless either, but their costs could be compared to those of moving to this essay’s contribution margin approach. However, there are two advantages to adding precision in the manner suggested by this essay: it dovetails with wrong-based rationales for limiting the scope of liability, see supra Part 5.1, and it fosters innovation in precautions aimed at more selectively reaching contributor risks, see infra Part 5.3.2.
We could imagine starting with the standard doctrinal approach in which harms outside the risk do not generate liability, but allow a plaintiff to demonstrate that the risk that eventuated in her harm was one that could have plausibly contributed to the justification for the omitted precaution. This showing should be relatively easy to make in most cases where the risk of the harm that eventuated was increased by omitting the precaution and there were no obvious downsides to controlling this risk along with the main or foreground risk. The defendant could then rebut this claim by showing that controlling the risk in question would have carried disadvantages that equaled or outweighed the benefits of doing so, even setting aside the fixed costs of the untaken precaution. In other words, the defendant would have the opportunity to show that the omitted risk control service was a wash or an eroder—a disservice, and not a service.

Notably, this approach would expand rather than contract the scope of liability relative to the status quo doctrinal approach by allowing the plaintiff to suggest that additional risks that would have been mitigated by the untaken precaution should produce liability. The defense that this framework would provide to the defendant—that the risk control service would have been a disservice—would, at most, revert to the standard doctrinal result. In setting standards for making that move back, courts could choose to consider matters like the incidence and currency of the costs of supplying the particular risk control service. For instance, a jurisdiction might require that the defendant show that controlling the secondary or background risk would have been a disservice in expectation not just society-wide, but to the members of the group of which the plaintiff is a member.

These determinations do not seem inherently more difficult to make than applying any other liability limiting doctrine. To be sure, there is a lurking question about product definition—or, in more familiar terms, the reference class. The discussion here assumes that courts will continue to use the same relatively broad risk and plaintiff categories that feature in current harm-within-the-risk analyses rather than splintering risk into infinitely fine classifications. In other words, I contemplate a granularity-neutral reform. This too is a concession to administrability. While narrower categories might add precision, more tractable categories can achieve most of the instrumental gains associated with fine-tuning incentives. I turn to those next.

\[106\] In addition to existing doctrinal limitations based on types of risks and types of victims, a defendant can already try to show that an exception to negligence per se should apply in their particular situation. See supra note 37 and accompanying text.

\[107\] See supra Part 2.2.2 (discussing questions of product definition).
5.3 The Incentive-Based Case

This last section discusses two incentive-based arguments in favor of the contribution margin approach proposed here. The first relates to the risk of overcompliance, while the second relates to the dynamic effects of a harm-within-the-risk rule on incentives to devise optimal precautions.

5.3.1 Overcompliance

Recall the concern that if we fail to assign liability for a risk that was in fact part of the justification for a legal rule, we undermine the legal rule by potentially making it cheaper for an injurer to violate it and just pay for the (improperly limited) damage.108 We can flip this point. If we do assign liability for failing to control a risk that would count as an eroder or wash in our schema, we may induce too much compliance with the legal rule. Overdeterred by excessive liability exposure, parties may oversupply lumps of legally specified caution.

Overcompliance might sound like an impossibility if we assume the legal rule is cost-justified overall. But there may be uncertainty about a rule’s applicability in some contexts. Making those who fail to comply with a legal rule liable for harm that has nothing to do with the risks they are obligated to control will cause uncertainty to be over-resolved in favor of precaution-taking when it is likely inappropriate. Say, for example, that a baby’s size is right at the line for qualifying for a C-section. The doctor is not certain whether the baby is above or below that line, but her best guess is that the baby is a little below it. Charging the doctor for an umbilical cord knot if she guesses wrong about size and delivers vaginally might skew her incentives toward too many C-sections under circumstances where doing so disserves her patients.109 In general, we want people making these difficult judgment calls to do their best to appropriately address the risks that are worth controlling, rather than have their decisions influenced by risks that are not worth controlling.

This argument assumes that mistaken precautions are empirically costly in a given context, and that society wants to equalize the costs of making an error in either direction.110 In some cases, distributive or other concerns may make one

108 See supra notes 56–57 and accompanying text.
109 Cooter and Porat note that there may already be a tendency toward too many C-sections. COOTER & PORAT, supra note 13, at 54 n.13; see Gilead & Green, supra note 2, at 1550–51 (discussing this example and arguing for a limitation on liability based on externalized benefits associated with natural childbirth).
110 See Grady, supra note 94, at 819–21.
kind of error normatively worse than another of equal expected magnitude.\textsuperscript{111} At times, society’s desire to induce compliance with a given legal rule is so strong that it wishes to impose a “sanction” for a violation, rather than merely find the appropriate “price.”\textsuperscript{112} In such instances, concerns about overdeterrence may be absent. But precautions are, in fact, often costly to society. One of the hidden costs of adopting a precaution in error, which this analysis seeks to highlight, is its potential to jointly fabricate additional risk control products that impose net social costs.

The overcompliance concern is particularly acute where the costs associated with controlling eroder risks are borne by potential victims themselves. Decision-makers may already bear too few of the relevant costs of risk control products.\textsuperscript{113} While potential injurers may attend to certain risk-risk tradeoffs in choosing precautions, costs of risk reduction that cash out in hassle, diminished enjoyment, or restricted freedom may simply be ignored. Restrictions on schoolchildren or patients, for instance, may be treated as if they were costless and employed whenever they might reduce — even infinitesimally — the risk of a harmful event. Although a contribution margin analysis cannot counteract all precautionary externalities, it can avoid exacerbating any existing skew they produce.

5.3.2 Dynamic Effects on Precautions

Imagine again that a legal rule calls for a precaution that bundles together both worthwhile and eroding risk control products. A potential injurer identifies a different way to successfully control the risks that are worth addressing without touching the risks that are eroders or washes. Say, for instance, that she invents a smart railing that selectively appears when people with disabilities are present, an auto-relocator for moving parked cars away from hydrants when fire engines approach, or personal protective gear for sheep that addresses disease spread without impeding movement. Will she attempt this DIY unbundling? Not if she will be liable for the eroder risks covered by the legally prescribed precaution, since her new risk control method is, by definition, not addressing those.

But if our potential injurer knows that only those harms resulting from contributor risks will be charged to her account, she is free to concoct new ways to

\textsuperscript{111} See supra note 53 (discussing the distributive implications of underdeterrence or overdeterrence in the railing case); cf. Keating, supra note 3, at 200 (noting an asymmetry in how harms and benefits are treated in law and morality).

\textsuperscript{112} See generally Robert Cooter, Prices and Sanctions, 84 COLUM. L. REV. 1523 (1984).

\textsuperscript{113} See, e.g., COOTER & PORAT, supra note 13, at 54 n.13 (making the point that C-section costs are largely borne by patients, not doctors). See generally Gilead & Green, supra note 2 (discussing the impact of positive externalities on the scope of liability analysis).
reach just those risks. If she succeeds, society saves the costs that would otherwise be wasted on eroders and washes. Thus, we might see more innovation in risk control if we let parties find alternative ways to address contributor risks, on pain of being liable for (just) those risks if they fail. By facilitating such innovation, the contribution margin approach would harness the dispersed specialized knowledge that parties themselves may possess but that legislators may lack. It would also leverage actors’ judgments about whether a given risk really is an eroder or wash rather than a contributor, as guessing wrong on this question when devising precautions would lead to liability under the contribution margin framework.

There is admittedly a tension between the sorts of categorical rules that feature in harm-within-the-risk and negligence per se fact patterns and the open-ended approach to risk-slicing that my approach seeks to encourage. Considered from a static perspective, an ideal behavioral rule or regulation should replicate what an actor would arrive at by considering all of the impacts of her behavior. But a contribution margin approach that leaves room for actors to discover new risk separation techniques has an edge in a dynamic environment where technologies and conditions continually evolve. Moreover, this advantage cannot be replicated by imposing liability for contributor and eroder risks alike and using adjustments in damage awards to fine-tune incentives.

Importantly, developing precautions that can surgically address certain risks without reaching others can sometimes lead to more precaution-taking, not less. When precautions bundle risk control products, plaintiffs may be unable to show that an omitted precaution was cost-justified. Consider a version of the railing example in which the proportion of people who are harmed by the railing’s presence greatly exceeds the number who are benefited by it, so that the rail is no longer cost justified overall. A subpopulation still benefits greatly, but their benefits are not just eroded but actually swamped by the effects on the more numerous majority. The existence of mechanisms that can selectively deliver protection just to the population that benefits would expand the set of untaken precautions for which a defendant would be liable and offer more, not less, protection to those for whom the precaution offers a valuable risk control service.

114 I thank William Hubbard and Spencer Smith for discussions on this point.
115 See Fennell, supra note 94, at 2436 n.247 (discussing instances in which a precaution’s lumpiness means it will not be supplied, even though it would have benefits under some scenarios).
116 See supra note 61 and accompanying text.
6 Conclusion

Although problems of the gun-and-paperweight variety might seem like stylized academic puzzles, they carry larger implications for tort law. The fact that precautions concurrently produce multiple risk control products with different cost and benefit profiles presents complications that existing approaches have not fully explored. Applying contribution margin analysis provides a vocabulary and conceptual framework for understanding whether a defendant was obligated to provide particular risk reduction services.

Under the approach I propose here, a defendant would not be off the hook just because an accident stemmed from a risk that was not the main one animating a legal rule. Nor would she be in the clear simply because the risk was not enough on its own to justify an untaken precaution, or because it was unnecessary to make the case for that precaution — so long as its contribution margin was positive. On the other hand, she would not automatically be liable simply because a cost-effective omitted precaution would have diminished the relevant category of risk. Instead, liability would depend on whether the costs attributable to that risk mitigation service (including, but not limited to, an increased risk of other accidents) would have made its provision a bad bargain. Whether one sees tort law as about wrongs or about efficiency, risk control disservices are worth identifying and eliminating.

The analysis here also hints at some questions worthy of further exploration. For example, we might wonder if negligence law sufficiently incorporates break-even analysis in instances where the amount or intensity of a given activity determines how much a risk reduction service contributes to the fixed costs of a given precaution. Should we see different penning rules for long-distance shipping than short-haul shipping, or paperweight-use rules that vary with client-contact hours? Further questions relate to the incidence of costs and benefits, and especially the potential for actors to neglect the ongoing costs that inefficient risk control may impose on others. The product definition issues raised here also connect to ongoing conversations about the appropriate degree of tailoring and personalization for legal rules.117

117 See supra note 55 and accompanying text.