Businesses, Technological Innovations, and Responsibility

Abstract: This article argues that businesses are morally responsible for compensating the people harmed by their activities even if they were not negligent, i.e., the businesses took reasonable precautions. Critics of this position maintain that responsibility requires choice, and by taking precautions, businesses choose not to harm others. This article accepts their argument's first premise but rejects the second premise. It contends that businesses often seek risky or innovative activities to increase profits, and the essence of innovative activities is that precautions cannot sufficiently reduce their foreseeable harmful consequences. The correct understanding of businesses' decision-making enables us to appreciate that businesses *choose* to undertake risky activities while *knowing* that they can harm others *despite* preventive measures. It follows that preventive measures should not serve as an excuse against liability for harm.

A 5.7 magnitude earthquake hit Sandra Ladra's house in Oklahoma in 2011. She recalls that "rocks started raining down" as the walls shook, and the chimney toppled (Oklahoma's News Four 2017). Her legs were severely injured, and her knee required replacement. Later, Sandra brought a lawsuit seeking compensatory damages from several companies conducting hydraulic fracturing nearby.[1] Due to the link between hydraulic fracturing and seismic activity, there have been many such lawsuits (see Watson 2021). To win them and obtain compensation for plaintiffs in the United States, lawyers must show that the corporations were negligent, i.e., didn't take reasonable precautions. There are also other types of tort cases against businesses where lawyers must prove negligence. They include respiratory illnesses from polluting factories, land damages from oil leaks, and financial harms from mortgage contracts. Our moral intuitions seem torn regarding the responsibility for harm in such cases. On the one hand, it

[1] *Ladra v. New Dominion LLC*, No. CJ-2014-00115 (District Ct., Lincoln Cty., Okla., Aug. 4, 2014).

seems wrong to hold the business responsible when it took all reasonable precautions. On the other hand, it also seems wrong that victims should remain uncompensated for harm caused by another's activities.[2]

Perhaps unsurprisingly, legal theorists are split in their thinking on who should bear the costs of such harm. As a staunch advocate of strict liability, Richard Epstein (1973, 1975, 2010) argues that the costs should reside with the defendant whose activity caused the harm. For him, our actions are predicated on self-benefit, and if sometimes they backfire on others, we should treat that backfire as if it hit us instead of them. Otherwise, we unfairly leave another party to reckon with the harm from our actions.[3] He contends that "once a defendant is allowed to excuse himself on the grounds that he acted with due regard for the plaintiff, it follows that he will be able to keep the benefits of his own actions even as he imposes their costs upon a stranger" (Epstein 1975: 398). In other words, exemptions based on non-negligence enable actors to isolate the benefits of their acts while leaving the burdens for others. For Epstein, all parties (individuals and corporations) should be subject to strict liability.

Critics of strict liability agree that parties should not be allowed to impose costs on others while reaping the benefits. Despite this common moral ground, they argue against strict liability because it ignores the defendant's agency (Perry 1988; Weinrib 1983; Ripstein 1999: 24–47; Coleman 2002: 63–103). Oliver Holmes approvingly quotes Chief Justice Nelson of New York, who notes that "an injury arising from inevitable accident, or, which in law or reason is the same thing, from an act that ordinary human care and foresight are unable to guard against, is but the misfortune of the sufferer, and lays no foundation for legal responsibility" (2005: 76). The

[2] By harm, I mean a setback to one's protected interests like bodily integrity and property. Harms can be converted to monetary losses or costs though such conversions will be complicated in the case of bodily injury.
[3] Epstein's argument is influenced by Judge Baron Bramwell's opinion in *Powell v. Fall*, 5 Q.B. 597 (1880).

argument has two premises. First, responsibility requires control or choice over the outcome. Parties should have been able to avoid harm (Perry 2001). Otherwise, their agency was uninvolved with respect to it and, therefore, holding them responsible would be unfair. Second, if parties take precautions, they are not choosing to harm another.[4] Instead, they were trying to avoid harm. It is unfair to demand anything more than reasonable foresight and care from others. Thus, causality alone is insufficient to establish liability.[5] Responsibility, moreover, requires the defendant to exercise agency over the harm through inadequate care. These scholars argue for the negligence standard, i.e., plaintiffs must prove defendants' negligence to hold them responsible.[6]

Both sides of the debate over strict liability seek to provide a general theory of tort law and, therefore, overlook distinctions among social agents. In contrast, this article argues that we must disentangle corporate agency from individual agency because corporations make *choices* with the *knowledge* that they lead to non-negligent harms (i.e., harms caused despite precautions).[7] Whereas individuals make choices based on various underlying motives, corporations act primarily—if not solely—for profit. Due to this aim, they choose to pursue innovative activities and know—because of their careful decision-making—that these

[4] This article often uses the term "precautions" instead of "reasonable precautions" partly for simplicity of prose and partly because—as argued later—what constitutes "reasonable" is not well-defined vis-à-vis corporations' innovative activities.

[5] This paper is only concerned with cases where it is clear that the plaintiff's activity caused harm to the defendant.

[6] Recently, Steven Shavell (2018) has argued that demonstrating negligence should be unnecessary when a party harms another while engaged in a risky activity. Shavell contends that parties have the best information about their activities' risk profile and can, therefore, moderate their risk-taking under strict liability in a way that maximizes aggregate welfare. Since Shavell's view is grounded in utilitarianism, it leaves the argument against strict liability on fairness grounds unchallenged. This article takes a fairness-based approach to tort law.

[7] While scholars (Fletcher 1972; Jones 1992; Piker 1998; Shavell 2018; Wendehorst 2020) have argued that the nature of certain *activities* makes them appropriate targets of strict liability, they have not made such arguments based on the nature of certain *actors*. My intervention in this article thus seeks to shift the very focus of the debate. Gregory Keating (2006: 18–30) probably comes closest to my argumentative move when he argues for strict liability for organized enterprises. Nevertheless, his argument remains quite different because it is not limited to businesses and not grounded in decision-making processes.

innovations will lead to harms despite precautions. In this way, corporations exercise agency over non-negligent harms. Drawing this distinction between individuals and corporations has important consequences for how we think about corporate liability.[8] Since businesses know that their innovative activities lead to non-negligent harms but still pursue them due to the potential profit, fairness demands that they compensate those who are harmed. Otherwise, they would privatize the benefits of their activities while socializing the costs. Ultimately, the two sides of this debate about tort law should agree on a middle ground: fairness requires strict liability for businesses.

The argument for this nonconsequentialist thesis unfolds in two steps. The first section advances a model of corporate decision-making that stems from investment managers' interest in maximizing risk-adjusted returns. It argues that businesses choose to undertake risky activities and know they will result in losses despite precautions. They face pressure to innovate, and innovations lead to harms notwithstanding due care. The second section draws out a key implication of this account of corporate agency. It contends that if there is no strict liability, corporations impose the costs of their risky activities onto others while reaping their benefits alone. As a result, they breach the moral prohibition against advantage-taking, i.e., corporations unfairly externalize the costs of risky activities while appropriating their benefits. Strict corporate liability is thus necessary to align our legal framework with our moral principles.[9]

[8] By "corporate liability," I mean liability for businesses, regardless of their legal form. This usage parallels the standard usage of corporate social responsibility (CSR) that refers to the social responsibility of all types of businesses, including cooperatives, sole proprietorships, partnerships, and corporations.

[9] The argument also challenges Ronald Dworkin (1986: 276–312) and Arthur Ripstein's (1999: 24–47) association of strict liability with libertarian and anti-redistributive thinking.

I. Corporate Decision-Making

Imperative to Maximize Sharpe Ratio and Innovate

As allocators of the wealth parked at financial institutions like pension funds, mutual funds, and hedge funds, investment managers allocate trillions of dollars to businesses across the economy, and they primarily measure performance through risk-adjusted return (Goltz 2008). While there are different ways to calculate the risk-adjusted return, the Sharpe ratio, named after the Nobel laureate William Sharpe, is the most popular. Most mutual funds display their Sharpe ratios prominently on their prospectuses. As a hedge fund marketing executive notes, "Sharpe ratios are treated with almost religious significance in the hedge fund business" (Lux 2002). They are the most widely used and known performance metric in the asset management industry (Eling and Schuhmacher 2007). The following formula calculates the ratio (Sharpe 1966, 1994).

$$Sharpe\ Ratio = (R_p - R_f) / \sigma_p$$

R_p represents portfolio return, i.e., the profit on the investment in a collection of businesses. R_f is the risk-free rate of return. An investor would obtain this return from government bonds like US Treasuries. Such bonds are considered risk-free because a government can always print its currency and return the bondholder's investment at maturity. σ_p is the standard deviation (i.e., square root of variance) of the investment's excess return over the risk-free rate. As a measure of risk, it indicates the ups and downs in the investment's value. The ratio thus captures the return per unit of risk.

The Sharpe ratio's broad appeal among investment managers is easy to appreciate. Most investors want to compare potential investments against the returns from keeping their money in the bank or government bonds. They want to know the excess return from an investment into businesses, and the Sharpe ratio's numerator captures this difference. Furthermore, they want to

know if they will be able to access their money during times of need without loss of capital. If the investment's value moves up and down a lot, investors may face a loss at withdrawal, and the denominator captures this risk. To appreciate their preference for low risk, consider the growth profiles of investments A and B below.

	Year			
	0	1	2	3
A	100	110	120	130
B	100	80	90	130

While both investments provide a 30% return over three years, the former is less variable. If investors wanted to redeem their cash at the end of the first or second year, they would avoid losing money due to the variability of returns. Therefore, as investment theory affirms, rational investors prefer investment A over B.

Given investors' interest in high risk-adjusted returns, investment managers allocate more capital to businesses with high Sharpe ratios.[10] These allocations can take different forms depending on the businesses' legal structures but are often in the form of share purchases. Regardless of their form, they increase the businesses' value.[11] This increase is good news for management teams because their compensation is frequently tied to their firm's value. Such incentive schemes tend to effectively align the management's decision-making with shareholder value creation (Hanlon, Rajgopal, and Shevlin 2003). Of course, if managers do not create value for their shareholders, the latter can replace the former. Investors thus use both carrots and sticks.

[10] They also attend to the correlation across their investments' returns, but we can set aside that complexity without any loss to this analysis.
[11] Another standard way to value a company is the capital asset pricing model (CAPM). Like the Sharpe ratio, it also relies on return and risk.

Consequently, there is an imperative in the business world to maximize profit per unit of risk. Since investors assess businesses based on their Sharpe ratios, businesses, in turn, evaluate their investments through the same metric, i.e., their ventures' Sharpe ratios.

$$Sharpe\ Ratio = (R_v - R_f) / \sigma_v$$

R_v represents the expected return from the venture, and σ_v is its expected standard deviation. To maximize the business value, they select the ones with the highest risk-adjusted returns.[12] Of course, there may also be other goals behind their activities.[13]

Since this ratio will be crucial to the argument in the next section, it helps to consider the systematic way in which businesses examine return (R_v) and risk (σ_v). Managers carefully and thoroughly catalog all contributors to their expected revenues, expected costs, and risks. Expected costs do not just include items like rent, utilities, and wages but also costs from machinery breakdowns like repair expenses and malfunction-related damages. The latter contains estimates of damages from both negligence and non-negligence. Managers incorporate both categories of costs because obtaining an accurate picture of potential losses is crucial. It is much better to anticipate loss-making costs and decide against a venture than to pursue it and realize the losses. The risk to capital arises from the unreliability of these estimates about revenues and expenses. While good information is available for breakdown costs from equipment used over long periods, these estimates may not be as precise for new technologies. Nevertheless, managers can roughly estimate them based on similar innovations in the past. The

[12] Some businesses may use other measures of risk-adjusted return like Treynor ratio, Sortino ratio, and Information ratio. Smaller companies may consider it informally through back of the envelope calculations. They also care about risk-adjusted returns even if they don't know the financial math. A small coffee shop may calculate its expected sales and costs to brainstorm ways of increasing this difference. Furthermore, it tries to anticipate and address potential risks. Against the risk of rising coffee prices, it could enter long-term contracts with suppliers. Against the risk of lawsuits from customers, it could ensure that its cups are well-insulated. Thus, the core feature of my corporate decision-making model (risk-adjusted return) applies to all businesses.

[13] I do not claim that management cares *only* about shareholder's interests. Therefore, my argument is compatible with both Milton Friedman's (1970) shareholder theory and R. Edward Freeman's (1983) stakeholder theory.

risk is that the machinery's actual costs (say, from a breakdown that harms adjacent machinery and people) are higher than expected. If that happens, the magnitude of losses could erode the capital base. After carefully considering the revenues, costs, and risk, managers can calculate the Sharpe ratio of the venture under consideration and use it to decide whether the profit's attractiveness outweighs its variability.

Since businesses want to maximize their Sharpe ratios, it might seem initially that management teams must aim to increase R_v while keeping σ_v low. However, it is hard to achieve both goals simultaneously. A company that strives for less risk conducts operations in tried-and-tested ways. It avoids significant investments into ventures that may not work out. Instead, it sticks to traditional business practices. Many are attracted to such low-risk enterprises where the costs and benefits are known with high confidence. Consequently, the market becomes quite competitive, and businesses must decrease prices to attract customers. As a result, profits diminish. As economic theory has long held, profit approaches zero in competitive markets. The attempt to lower σ_v leads to lower R_v. Therefore, businesses' attempt to maximize risk-adjusted return leads to a choice between two routes. On the one hand, they can continue to operate in their tried-and-tested ways and satisfy themselves with low profits. On the other hand, they can try innovative approaches to seek greater profit.

Smaller businesses tend to pursue low-risk enterprises. Consider the types of businesses that occupy the small town center: bakeries, bookstores, restaurants, and gift shops. These businesses are engaged in age-old activities. Of course, they try to differentiate themselves from other similar businesses with their menu of items and ambiance. Still, they are not usually investing large amounts of capital toward a novel project. They are typically run as sole

proprietorships or small partnerships. A couple running a bakery may simply be looking to generate a stable income for their family's needs.

Attracted by higher profits and possessing greater resources, larger businesses typically choose the high-risk path. They may introduce new products into the market that bring more revenue, or they may employ technology that reduces their cost of producing existing products. As an example of the former, consider innovative financial products or fancy dietary supplements. As an example of the latter, consider a new technology to extract oil and gas from shale rock or an untested method to create battery chemicals. Corporations pursuing such routes know that they are taking greater risk. However, they believe that their innovations will distinguish them from competitors and lead to extraordinary profits. A retail bank may choose to take greater risk by lowering its lending standards. It might give out mortgages to subprime borrowers whom it would have previously deemed uncreditworthy. If the economy remains strong and these customers pay back their loans, the bank would have made an extraordinary profit. Its risk, of course, is that they don't, and it loses money. Importantly, the costs from business risk-taking may also fall on the public. Subprime borrowers may end up in financial distress. Alternatively, consider investment banks that took greater leverage through financial derivatives in the years before 2008. While their strategy yielded high returns for them during the business cycle's peak, it led to catastrophic losses during its trough for them and others. By deepening the 2008 financial crisis, it caused widespread hardship for the public. Beyond big banks, large technology companies and oil companies also systematically maximize profits through greater risk-taking. These businesses tend to be publicly traded corporations; innovation is the coin of this realm.

Innovations Entail Non-negligent Harm

Innovations carry a material risk of harm *despite* precautionary measures or due care. Since an innovation is, by definition, something new, there is inadequate information about how it harms. Some of its consequences may be unknown, and it might take years of scientific experimentation to ascertain them. This paper sets aside such unforeseeable harms to focus on foreseeable harms. Even when the harmful consequences of innovations are foreseeable, they may not be preventable. Natural and social scientists may have data showing the link between their actions and the harms but lack an understanding of how to prevent them. For example, it may be foreseeable that novel leveraged financial instruments would lead to an economic crisis. Nevertheless, the reasonable level of leverage that prevents such a crisis could be unknown. Similarly, it might well be foreseeable that a new battery chemical is flammable. However, the specific precautions necessary to avoid fire may not be fully understood in its early stages of use. Of course, it is possible to obtain a sense of the preventive measures through comparison with similar products or experimental testing. However, these would be inadequate to take the probability of harm near zero. Thus, what constitutes reasonable care for innovations is indeterminate. The more risky or innovative the businesses' activities, the less clear the appropriate level of due care would be.[14] Furthermore, companies engaged in technologically sophisticated enterprises are aware of this inability to prevent harm. As specialists in their products and fields, they know that innovations lead to damages despite precautions.

There is an additional reason why businesses' innovations lead to non-negligent harm. Businesses operate at a much larger scale compared to individuals. When a company chooses to follow an innovative path, it makes a choice that commands dozens to thousands of individuals

[14] For a detailed discussion of how innovative activity often proceeds without a complete understanding of its routes to harm, see Laura Dunham's (2007: 19–23) work.

to pursue it over a period of time. Therefore, even if the non-negligent harm's probability is low, it will still eventually occur due to the law of large numbers (see also Keating 2006: 20–21). By asking a large number of people to engage in a complex activity over time, the company knows that accidents will happen sooner or later. Consider a company preparing for a rocket's launch or laying pipes for oil extraction. Even if people are careful in such complex operations, there are bound to be some accidents given the number of work hours required to accomplish a large number of tasks (attaching components, connecting pipes, fastening screws). Alternatively, an eccentric engineer who built his own battery-operated car may luck out by not exposing the battery to the environment that triggers a fire. However, if a corporation sells thousands of such vehicles, some will get operated in environments that lead to fires. Thus, corporations can try to be careful, but they won't get anywhere near eliminating harmful consequences. In short, businesses' innovative activities lead to non-negligent harms due to their greater risk (because studies that can lower risk are not yet complete) and greater scale (because novel technologies are used at high frequency).

To recap the argument so far, businesses face a choice between low and high-risk enterprises. Attracted to high returns, some choose high-risk activities. Importantly, they know that their innovative activities will cause harms despite precautions. Thus, they choose risky activities and are aware that they will lead to non-negligent harms to others. In other words, they do—if indirectly—choose to harm others. My argument meets the agential condition for responsibility espoused by advocates of the negligence standard, albeit for a subset of tortfeasors, namely businesses. I suspect these advocates' oversight stems from the study of cases and intuitions regarding individuals. As this section has shown, businesses choose differently from individuals. They aim to systematically maximize risk-adjusted return through careful

calculations. In contrast, many individuals do not face the competitive pressure to innovate because they spend their lives in community-oriented or spiritually inclined pursuits.[15] My argument elaborates Epstein's (1975) insight that actions are predicated on self-benefit by modeling corporate decision-making.

Advocates of the negligence standard might grant that businesses choose non-negligent harms but insist that this choice is quite different from the direct choice made when a party harms another negligently. There is a morally relevant difference between a party that harms another while taking precautions and a party that harms another through sloppiness. Their moral accountability should be different. While there is a morally relevant difference between the two routes to harm, I contend that this difference matters for blame, not the responsibility to compensate.[16] A party that directly harms another through negligence may be apt for blame because it didn't accord the plaintiff due care. When a battery-maker cuts corners during manufacturing or a bank sells unsuitable products, and the risk materializes, they might be blameworthy and responsible. They sloppily carried out an activity and thereby harmed others. However, the central question confronting us in tort litigation is not about blame. Instead, it is about responsibility to compensate for harm.[17] Specifically, should liability reside with the corporation that causes it? This question is about compensatory damages as opposed to punitive damages. The account of corporate agency developed in this section will help answer it in the next section. This account tells us that when we encounter a non-negligent harm caused by a corporation, we know that it resulted from profit-driven risk-taking. Drawn to higher profits, the

[15] For a powerful argument that individuals value in ways that flout cost-benefit calculations, see some of Elizabeth Anderson's (1993: 190–216) early work.
[16] In his argument for strict product liability, Andrew Piker (1998) similarly notes that blame is not necessary for liability.
[17] There are various responsibility concepts and Nicole Vincent (2011) provides a helpful taxonomy. She uses the terms outcome responsibility and liability responsibility to distinguish—what I've called—blame and responsibility. John Fischer and Mark Ravizza (1998) call the former moral responsibility.

company must have pursued innovations and innovations cause harm despite precautions. Furthermore, it knew that such damages would occur (even if it does not know their exact timing and magnitude) because its decision-making is systematic and thorough. It considers all foreseeable costs regardless of whether they result from negligent or non-negligent acts. The corporation's choice to knowingly harm another is relevant for the attribution of remedial compensation.

II. Fairness Requires Strict Liability

This section draws out the normative implications of my account of corporate decision-making. I argue for strict corporate liability in two steps. First, I demonstrate via a case study that businesses choose to shift costs of non-negligent harms onto the public in the absence of strict liability. Second, I argue that this business behavior violates the moral prohibition against advantage-taking. Strict corporate liability thus turns out to be necessary to avoid unfairness.

I focus on fracking because its harms have spurred a lot of tort litigation. There have been hundreds of cases like the one mentioned in this article's opening lines (see Watson 2021). Fracking is the informal name given to hydraulic fracturing. It is a method of extracting oil and gas by applying pressure to rocks deep beneath the Earth's surface. The goal is to create cracks or fractures in the rocks through which natural gas and petroleum would flow out. Pressure is applied via a fracking fluid consisting of water, sand, and chemicals. After its high-pressure application, the toxic fracking fluid or wastewater becomes a byproduct that is usually injected underground. Many companies have been attracted to this innovative method of extracting oil and gas due to the potential profits. However, it carries environmental risks like groundwater and surface-water contamination, air and noise pollution, chemical spills, disruption of wildlife habitats, and seismic activity. Unfortunately, these risks have often materialized into harms. As

seen from Sandra's case earlier, earthquakes have caused physical injury to people and damaged their properties.

Scientists have alerted society to the relationship between fracking and seismic activity for many years. They have "documented an astronomical rise in seismic activity across the central and eastern United States, linking it to wastewater pumped into the ground from burgeoning oil and gas production" (Rosen 2015: 1299). Mark Peterson, head of the National Seismic Hazard Project, considers induced seismicity "to be primarily triggered by the disposal of wastewater into deep wells" (Oskin 2015). Many other studies across the globe have corroborated these claims (for example, see Andrews 2015; Ellsworth 2013). They establish that seismic activity is a foreseeable consequence of hydraulic fracturing. Unfortunately, it is tough to prevent. As one expert put it: "there has been no suggestion in recent studies that the hydraulic fracturing associated with seismic activity has been conducted in a negligent manner" (Watson 2016: 26). Despite precautionary measures, corporations have been unable to eliminate seismic activity. Given my argument from the last section, this should be unsurprising. Non-negligent harms are essential features of innovative activities, and fracking is a novel way to extract oil and gas. Therefore, when fracking companies proceed with operations, they make a choice and know that it would lead to damages from seismic activity, even though the identity of their victims is unknown when they proceed. Consider the two hypothetical scenarios below to appreciate this element of choice and its unfairness.

Scenario A

An oil and gas company called Foreseeably Seismic is considering extraction in area A. Based on my argument in the previous section, its management carefully catalogs all the revenues and costs. Foreseeably Seismic's engineers inform their management team that fracking

will cause seismic activity, and they cannot eliminate the possibility of its harms through the available preventive measures. The engineers provide management with an estimate for the damages to structures near the drilling site. A probability distribution accompanies this estimate because scientists have not fully understood how wastewater disposal induces seismic activity. Incidentally, the company owns much of the land surrounding its potential operation site; therefore, the tremors would damage its structures. The management team calculates the expected profit from this venture and its expected variability. Based on the calculations, it expects a return ($R_{v\text{-}a}$) of 8% and a standard deviation ($\sigma_{v\text{-}a}$) of 6%.[18] A risk-free rate of 2% yields a Sharpe ratio of 1.

$$\textit{Sharpe Ratio} = (R_{v\text{-}a} - R_f) / \sigma_{v\text{-}a} = (8 - 2) / 6 = 1$$

The management team judges this risk-adjusted return to be too low. Since the profit from the venture does not outweigh its variability, the company's investors would be displeased. The company decides against the investment in hydraulic fracturing.

Scenario B

Consider now a scenario that is similar in all respects but one. Most of the land adjacent to the proposed fracking site belongs to individuals not affiliated with Foreseeably Seismic. Once again, the management team considers the potential profit against its variability. The risk and cost of earthquakes fall on the public because its property would receive damages. Foreseeably Seismic's profit is secure from the vagaries of seismic activity. The public will suffer injuries from time to time, but the corporation will not be liable (assuming negligence standard) since it would be taking precautions. Once again, the company's management runs some numbers. Based on the calculations, it expects a return ($R_{v\text{-}b}$) of 10% and a standard deviation ($\sigma_{v\text{-}b}$) of 4%.

[18] The second letter of the subscript represents the scenario name.

The return is higher by 2% compared to scenario A because the company has transferred 2% of the cost ($C_{p\text{-}b}$) onto the public without transferring any revenue. The risk is lower by 2% because the company has externalized 2% of the risk ($\sigma_{p\text{-}b}$) onto the public. The public thus effectively underwrites some of the costs and risks that lead to Foreseeably Seismic's profit without having a share in it. Based on a risk-free rate of 2%, these numbers lead to a Sharpe ratio of 2.

$$\textit{Sharpe Ratio} = (R_{v\text{-}b} - R_f) / \sigma_{v\text{-}b} = (10 - 2) / 4 = 2$$

Given the higher Sharpe ratio this time around, the management team decides to proceed with the fracking operation. This decision constitutes a choice to move ahead with wastewater disposal, knowing it would foreseeably harm others' property.

A few months later, an earthquake damages the property of nearby residents. Foreseeably Seismic's lawyers use the negligence defense to avoid liability for damages. However, even though the harm to others' property was not out of negligence, it was still foreseeable and avoidable. What seems accidental is not that much of an accident; the company could avoid it just like it avoids cost to itself in scenario A. Even if the company had pursued the project in scenario A, it would have had to pay for damages. Analogously, it can compensate the public for damages in scenario B. Should the company be strictly liable to the public for damages? If we answer affirmatively, we ease the path to compensation for many plaintiffs like Sandra. This question is, therefore, of great practical significance.

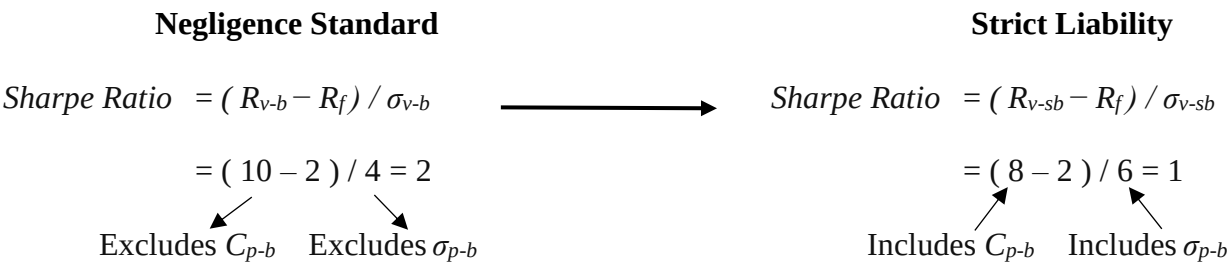
I appeal to the common moral ground between both sides of the strict liability debate to answer it. They would agree that it is unfair for some parties to use others as a mere means to their private ends. On its most uncontroversial interpretation, this Kantian principle simply asks society to establish rules of interaction that prevent one segment of society from targeting others' welfare for private benefit. As an example of such targeting, consider a chemicals manufacturer

that dumps toxic waste into a river (instead of processing it) after calculating the positive impact of this action on its bottom line. Rules of interaction that permit such actions would be impermissible under Scanlon's (1998: 189–247) contractualism (a particularly prominent lens with which to examine ethical problems that arise from risk-imposition) because potential victims would reasonably reject them. However, one need not be a Scanlonian contractualist to affirm this fundamental point about fairness. Indeed, Nozickian libertarians who consider rights sacred, Rawlsian liberals who profess separateness of persons, and even rule-utilitarians who contend that maximizing aggregate welfare requires basic side-constraints on action uphold such a view on fairness. The moral prohibition against turning others into a mere means is hard to contest, and it constitutes the foundational principle of my argument for strict liability.

Let us apply this principle to Foreseeably Seismic's actions in scenario B. The company chooses to pursue a risky activity for higher profit, and its choice stems from a thorough evaluation of all foreseeable costs and risks. Foreseeably Seismic knows about the potential non-negligent harms to the public but excludes them from its Sharpe ratio calculation, as seen in the equation below. The absence of strict liability effectively subsidizes its risky venture; the public partially shares the costs and risks without any share in the revenue. Given the potential for a high risk-adjusted return, Foreseeably Seismic decides to proceed with the fracking operation. It does not choose to harm another directly but makes a choice that foreseeably harms someone whose identity is unknown at the time of its decision. This choice constitutes an exercise of agency that harms through an accident-prone technology. If Foreseeably Seismic does not assume liability for these harms, it turns the other party into the mere means to its profit-making end. Fairness thus requires strict liability.[19] Under strict liability, the company's Sharpe ratio

[19] Fairness may also require notifying vulnerable populations of the risks and obtaining consent to operate. I do not explicitly argue for these requirements here; they would be somewhat specific to the business activity.

results from more inclusive calculations of return ($R_{v\text{-}sb}$) and risk ($\sigma_{v\text{-}sb}$). They include the cost ($C_{p\text{-}b}$) and risk ($\sigma_{p\text{-}b}$) from its activities to the public, which the negligence standard leaves out.



My argument for strict liability, of course, extends beyond this case study about fracking companies to all businesses. I argue that businesses know that their innovations will lead to non-negligent harm to others. If they still choose to pursue their risky activities and do not compensate the harmed, they effectively use the public as a mere means to their profit-making ends, i.e., they contravene the shared Kantian precept. Compensation is necessary to avoid violating the moral principle. Notably, I do not argue that risk-taking simpliciter is morally wrong. Far from it, risk-taking is a part of a healthy economy. What is morally wrong is risk-taking that leaves its victims without compensation.[20] The fact that a business took precautions is irrelevant because precautions cannot sufficiently reduce the risk of harm. While the company is not blameworthy when it takes precautions, it is still liable since it purposefully engages in an activity that foreseeably harms.

Since my argument generalizes beyond fracking, it captures many other cases of risky corporate activities. A company that makes batteries or lawnmowers may cause injury to its customers through faulty design. A chemical factory may release gases that cause respiratory

[20] In arguing for strict liability, I do not intend to convey that monetary compensation can fully make up for the loss of a limb or a loved one. As society progresses technologically, it must—unfortunately—put some of its members at risk. While society cannot eliminate risks, it can—and should—ensure that risk-taking is fair.

illnesses among those in its vicinity. A nutrient manufacturer may sicken people through subpar ingredients in its supplements. A bank's products may cause financial loss to those who purchase them and destabilize the economy. All these harms are foreseeable; indeed, they are the paradigm harms from these activities. However, they might occur despite precautionary measures because businesses' innovative practices often run ahead of a complete understanding of the necessary precautionary measures. In all these cases, the corporation should be responsible because it chooses to pursue an activity that foreseeably harms another. It is a virtue of my view that it offers a consistent rationale for treating all business activities similarly. Currently, there is strict liability for only some types of corporate harm.[21] My normative justification for strict corporate liability neatly unifies the disparate justifications for these types of strict liability. Another virtue of the view is that businesses that take their social obligations seriously or take low risk will rarely be in trouble with the law. If Foreseeably Seismic's management chooses to treat the property of others like its own in scenario B, then it would not have to pay compensatory damages.[22] Also, small businesses that take little risk need not worry about strict liability because their operations would rarely harm others. My argument mainly affects conglomerates pursuing cutting-edge innovations. It asks them to reckon with *all* costs and risks from their ventures.

Critics may grant my fairness-based argument for strict liability but worry about negative consequences. By increasing corporate expenses, strict liability could discourage socially beneficial innovations (Holmes 2005: 76–77).[23] If Foreseeably Seismic decides against drilling

[21] For example, if a person is injured from a defective product or gets hurt from an ultrahazardous activity like blasting, then the company is strictly liable.
[22] Perhaps it subscribes to a version of stakeholder theory that gives equal weight to the interests of community members and shareholders.
[23] See also *Brown v. Collins*, 53 N.H. 442 (1873), where the court stated that "it is impossible that legal principle can throw so serious an obstacle in the way of progress and improvement" while deciding against holding a defendant strictly liable.

in scenario B, society loses a crucial energy source. The critics' concern may appear plausible since fracking is credited with leading to American energy independence. Few can doubt the strategic benefit of this self-sufficiency after Russia's invasion of Ukraine. This critical benefit may not have been possible had strict liability deterred fracking. Similarly, strict liability may deter electric vehicle manufacturers from producing cars and delay the adoption of an environmentally friendly product. Because it may sap innovation, society should avoid strict liability. According to this consequentialist line of reasoning, considerations about aggregate welfare should hold us back from endorsing strict liability.

Fortunately, the Sharpe ratio helps to notice this argument's weakness. From the fact that strict liability increases corporations' costs, it does not follow that they will not pursue innovations. Instead, corporations could raise their prices to increase their revenues. Consequently, their Sharpe ratios increase, making their business enterprises worth pursuing. Foreseeably Seismic would not stop drilling because the increased revenues counteract the increased liabilities. Critics cannot respond that the company may be unable to raise prices because they accept that aggregate social benefit is positive, which means that the product's real value to society exceeds its price. People should be willing to pay more for it. Furthermore, if the products align with overall societal values such as energy independence and environmental protection, the government can help its citizens pay through tax rebates, etc. Thus, strict liability need not lead to worse consequences.[24] The correct moral response to risky albeit vital enterprises is not to let the unfortunate few suffer damages without compensation. Instead, it is to

[24] For a detailed consequentialist argument in favor of strict liability, see Shavell (2018).

get beneficiaries to fully pay for the benefit they derive and direct some of it toward victims. Socially beneficial risk-taking need not lead to advantage-taking.[25]

III. Conclusion

Torts begin with a specific harm or injury that some party has suffered. The central question they raise is: where should its cost reside? When the defendant is a corporation and was not negligent, we should not hastily conclude that it did not choose to harm the other party. We should not—like advocates of the negligence standard—tell the plaintiffs to treat their injury as if it was the result of a natural disaster or an act of God, which was beyond anybody's control. Instead, the harm occurred due to the corporation's careful decision-making (in response to competitive market pressures) that included an awareness of the potential for this harm. If it does not provide compensation, the corporation effectively turns the other party into a mere means to its profit-making end. Fairness prohibits turning the public into the mere means to a private end. It requires strict corporate liability.

In addition to being the morally correct legal framework, strict liability has practical benefits. Specifically, the public does not need to rely on regulators to secure its well-being. Government regulators are well-known to face informational constraints, even when assumed to be isolated from political and financial influence (Shavell 1984). For example, regulators frequently rely on the industry for the data they need to regulate. In such cases, the industry faces a conflict of interest. It may not want to share data that undermines its capacity to generate a high

[25] This paper focuses on cases in which one party clearly causally harms another. However, scholars like Ronald Coase (2013: 837–838) and Perry (1988) would object that all harms are jointly caused. It is beyond the scope of this essay to address this objection and I recommend the interested reader to look at Epstein's (2010: 17–24) response. Furthermore, there are many cases where science establishes with statistical confidence that a certain activity causes a certain harm. For example, pollution from coal power plants causes health problems and fracking wastewater injections cause harmful seismic activity. In such cases, there is one party that clearly harms another. To argue for strict liability is not to argue that we always have clarity on whether the business caused the harm. Rather, it is to argue that once we know that it did, then the business ought not to excuse itself on the grounds that it took precautions.

profit. For decades, information from the oil and gas industry cast doubts on climate change research.[26] Thus, regulators are typically at an informational disadvantage when establishing the appropriate codes and protocols. They simply cannot keep up with the pace of innovation. Therefore, companies that take "due care," where "due care" is a dubious level of precaution specified by regulators, easily get away with causing large amounts of loss to people. While regulators serve an important role, society can better protect the public by asking companies to self-monitor based on their superior knowledge. Given their access to data and research, companies are best placed to determine the appropriate level of care (Shavell 2018). Strict liability puts this informational advantage at the public's service by promoting self-regulation. Companies incorporate their latest research and data into their precautionary measures because minimizing harms to the public is the same as minimizing costs to themselves. Thus, my proposal guarantees that businesses treat potential harms to the public with utmost care.

It should also be attractive to both sides of the debate on strict liability because it retains their central commitments. The central commitment of advocates of strict liability is that the actor should not be able to "keep the benefits of his own actions even as he imposes their costs upon a stranger" (Epstein 1975: 398). My proposal respects this insight while limiting its scope to business activity because individuals may not systematically maximize self-benefit. The central commitment of advocates of the negligence standard is that parties should not be held responsible for unchosen harms. My proposal respects this commitment but limits its scope to individuals by showing that businesses can choose outcomes that seem accidental and hence unchosen. Thus, I hope this article can help achieve a partial truce between the two sides.

[26] Denis Arnold and Keith Bustos (2005) analyze the considerations that bear on strict corporate liability for global climate change.

Ultimately, the stories of corporations enjoying years of high profits while they harm the public are numerous. It is critical to recognize that such harms result from the distinctive motivation and conscious decision-making of businesses. Damages from business actions are not as accidental and unavoidable as suggested by critics of strict liability. Given their motivation, businesses sometimes make purposive decisions that systematically shift costs onto others, and such externalization is unfair because it is accompanied by the privatization of reward. The absence of strict liability continues to unfairly leave costs with the public that belong—from a moral point of view—with businesses. In a world where the trend toward innovative technologies continues unabated, where environmental damages become irreversible, and where regulatory bodies are increasingly politicized, the move to strict liability is urgent.

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